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CONTENTS

EDITORIALS 301
LETTERS TO THE EDITOR 304
NEW BOOKS 304
SOME NEW IDEAS IN BUNK CAR FACILITIES; H. F. HAAG 305
CORRECTING A DEFECT IN THE END LIFT OF A DRAW SPAN 307
THE ESSENTIAL DUTIES OF THE TRACK WALKER; W. F. RENCH 308
THE HEAT TREATMENT OF TRACK MATERIALS; C. B. BRONSON 309
A TIMBER SMOKE JACK 310
RECENT EXAMPLES OF TURNTABLE DESIGN 312
EFFECT OF TIME OF CUTTING TIMBER ON ITS DURABILITY 314
PENNSYLVANIA HAS NOVEL TREATING PLANT 315
THE IMPORTANCE OF THE TIE RENEWAL PROBLEM; F. J. MEYER 317
A NEW METHOD OF BRACING SHIMMED RAILS 318
AN AUTOMATIC SWITCH LOCK 318
IN CASE OF DOUBT; CHARLES H. SMITH 319
ENGINEERS' SALARIES ADJUSTED 321
A DERRICK FOR SHIFTING TRACK 322
TRACK DEPRESSION LEADS TO DIFFICULTIES 323
ACTIVITIES OF THE RAILROAD ADMINISTRATION 325
CUTTING AND WELDING WITH HYDROGEN GAS 328
THE MATERIAL MARKET 328
ASSOCIATION ACTIVITIES 329
GENERAL NEWS 331

Better Think It Over

Any plan for the management of the railroads by a group of men, all or a part of whom are selected from among the employees by some form of popular election, means just one thing—politics—not the politics involving all of the people of the country, but politics affecting all railway employees. Furthermore, in an organization comprising 2,000,000 men, the influence of the individual in the management of the business would indeed be small. In fact, it is to be questioned whether he would exert as much influence as he does under private control of the railroads, that is, unless he should become a railroad politician. In other words, the local, regional, or national delegate, or by whatever designation he would be known, would have more influence than the foreman, the supervisor or division officer. To secure advancement, one would have to court favor with the politician rather than to gain the esteem of his superior. Of course, some of the vices of such a system might be corrected eventually by some form of civil service, which in turn would introduce other evils such as its deadly effect on initiative. Think it over.

Otherwise He Has Nothing to Do

To a man schooled in western standards of track maintenance the duties of a track walker as outlined in an article appearing on another page would seem to cover a decidedly formidable mass of detail. In fact, it includes nearly everything that would be done by a track gang except to change out a rail. Some readers may perhaps even wonder what is left for the track foreman and his gang to do, if everything specified in this article is done by the track walker. It must be remembered that density and speed of traffic, and, therefore, standards of track maintenance, vary from those prevailing on a single-track "cow path" to those encountered on a four-track "boulevard." What may be necessary in the one case may amount to extravagance in the other. It is true, that track walkers are not required under many conditions of traffic, but on a line which boasts of any train service at all it is generally considered necessary for some one to see all of the track each day, a duty which is imposed in the majority of cases on the foreman. The study of track inspection referred to above presents a complication of defective track conditions which must be noted and corrected by some one, if not by a track walker, then most likely by the foreman himself.

Watch Your Camps

The article on bunk cars appearing elsewhere in this issue should revive interest in a subject that was given extraordinary attention about two years ago. It has been said with a great deal of truth that more advancement in the proper housing and feeding of laborers was made during the first two years of labor shortage following the inception of the European war than was made in the preceding ten years. The equipment described in the article referred to embodies some new developments. However, the chief value in the reading of this will arise from a revived attention to the subject. While the proper housing and feeding of men implies adequate equipment, it also requires scrupulous regard for clean-

liness in operation. A gang may be handled fairly well in poor cars if they are kept neat and clean, but the most carefully designed and constructed cars or buildings will afford little better accommodations than the worst shack if allowed to get in a filthy condition. Some foremen and their gangs will keep their camps in good condition and insist that their food is cooked and served with an adequate regard for cleanliness. But as a general proposition the only way to insure that *all* the camps are in a habitable condition is to prescribe regulations and insist that they be obeyed. It is necessary to keep everlastingly after them.

LACK OF MATERIAL DELAYS MAINTENANCE WORK

MAINTENANCE of way work in common with almost all industrial operations was seriously handicapped last year by inability to secure adequate quantities of materials. While these conditions are now greatly improved and are being eliminated rapidly, maintenance work has been delayed this year by the late receipt of materials. For instance, while tie production is now being carried on at a rate sufficient to meet the requirements, the increase in production came so late in the season that many roads were unable to adhere to their normal programs of extensive renewals in April, May and June.

The same situation exists with reference to rail. The United States Railroad Administration ordered no rail until May of this year, when 200,000 tons was ordered, the last of which is now being turned out, and depended on deliveries on orders placed by the roads prior to federal control up to this spring. Within the last few days it has received quotations on 100,000 tons additional and it is expected that contracts will soon be placed for this. However, this rail cannot be delivered until September and October, too late for proper use on northern roads. While delays such as these may be a necessary condition in our readjustment after the war, they have added to the difficulties of maintenance this year and to the disturbance of the normal season's program.

TWO ALTERNATIVES IN TIES

AT THE RECENT hearing before the Interstate Commerce Commission to investigate the substitutes for wood for ties and other railway purposes in accordance with the Dyer resolution passed by Congress, it was stated that the destruction of American forests has reached the stage where replacement cannot be looked to as the remedy. Two alternatives were suggested; the development of substitutes for wood, and the importation of wood from the forests of foreign countries. The question of substitute ties is not new for it has been the subject of much study and experimentation on the part of railway engineers for years. Steel ties have been used extensively on one or two roads and in limited quantities on others. A wide variety of designs of concrete ties have also been inserted in track for experimental purposes. The proceedings of the American Railway Engineering Association contain many references to these experimental installations, while the Tie committee of that association has performed a valuable service for a number of years by recording the annual development in these experimental installations from year to year.

The question of the importation of foreign woods has not been given such general consideration. Representatives of the Atchison, Topeka & Santa Fe visited a number of foreign countries several years ago and have conducted extensive experiments with certain timbers from Japan and Mexico. The Delaware, Lackawanna & Western and one or two other eastern roads have made certain experiments with Brazilian ties. In general, however, it may be stated that the installation both of substitute ties and of foreign timbers have not yet passed the experimental stage. The decision as to which of the two alternatives shall ultimately be accepted is one primarily of economy and cannot be determined until the relative costs in large quantities becomes known. In the mean time the domestic tie situation is not now regarded as seriously as it was a few years ago and the drain on our forest resources can be still further reduced by the more scientifically renewal of ties and the more extended treatment of timber.

MAINTENANCE CONVENTIONS AN OPPORTUNITY

THE SEASON of the maintenance of way conventions is at hand. The roadmasters will meet in Chicago on September 16-18 inclusive, while the bridge and building men and the maintenance of way master painters will meet at Cleveland and St. Louis respectively on October 14-16.

The attendance and interest at all of these conventions last year broke all previous records. The outlook this year is equally favorable. The United States Railroad Administration has done much to stimulate interest in the various railroad associations by its wholehearted support and encouragement, an action for which it deserves much credit. The strenuous period through which we are passing adds much to the value of a thorough discussion of the problems of the day and the interchange of opinions as to their solution.

Those holding responsible positions in these societies bear a responsibility to the men composing their membership, to present as instructive and valuable a program as possible, full of suggestions for meeting the problems of the day. The extent to which they present programs of this character will constitute a measure of the success of these organizations. Maintenance of way men should make every reasonable effort to attend their respective conventions, for the time so spent will be returned many times over in increased efficiency if they make the most of their opportunity at these meetings.

THE IMPORTANCE OF DIFFERENTIALS

PROGRESS in any line of endeavor hinges directly upon the desire of individuals for better conditions. When the time arrives when an individual no longer strives for an objective, his progress ceases. This holds true also for collections of individuals, whether they constitute a company or corporation conducting a business or the organization employed by the large corporation.

A realization of this general principle has, in the past, been considered basic in the building up of successful organizations—and one of the chief efforts of men employed to supervise the work of others has been to plan their organizations so that it was easy for the ambitious men to raise themselves above the general level and to make the effort to rise worth while by promise of adequate rewards. Experience also seems to point to the fact that it is not the part of wisdom to permit a man, once he has risen out of the general level, to remain too long in his new work. That is to say, efforts have been made to plan promotions and transfers so that a change for the better is always imminent for those making good in their present jobs. In such an organization, equitable financial differentials have had to be

maintained between positions involving varied responsibilities.

At the present time, however, the tendency seems to be at variance with past practice in this direction and towards raising the general level regardless of the worth of individuals. Nowhere is this tendency more evident than on the railroads. For instance, in the maintenance departments of certain roads, the differential between section laborers and the foremen does not exceed five cents per hour. Is this sufficient to encourage the men to strive to fit themselves for a foreman's position, with its many responsibilities? It seems doubtful. On the other hand, will this condition not encourage the foremen to look elsewhere for positions where responsibility carries with it a commensurate reward? These inequalities, which are the result of the recent wage adjustments, are by no means confined to laborers and foremen. They exist throughout the entire maintenance of way organization. Taken together, they constitute a serious problem for the higher supervisory officers and one that demands prompt attention.

MAKE EVERY TIE RENDER FULL SERVICE

TRACKMEN HAVE realized for years the importance of the proper determination of the time to renew ties in order to secure the full service from them and at the same time not unduly weaken the track. When they have erred, it has usually been on the side of safety and properly so. However, on inspection of the ties removed from track frequently shows a considerable number which have been removed prematurely. This is unfortunate and expensive at any time. It is doubly so now when the price of ties has practically doubled and the supply is below normal at the present high prices.

This condition justifies railway men in giving serious consideration to the methods in force on their lines to determine the selection of ties for renewal. Some roads rely entirely on the judgment of their section foremen and leave the problem entirely in their hands. On others the roadmaster or his assistant examines the ties with the foremen and decides on those to be replaced. On still other roads a system inspector makes this decision. Each of these plans has its advantages and disadvantages. The first places the responsibility for the maintenance of safe track in all its angles on the section foreman where it belongs. It has the handicap that it does not tend towards standardization of practice, for 30 foremen will have almost as many ideas as to condition of a tie requiring its removal from the track. The third method tends to create a division of responsibility between the section foremen and the inspector, and if the inspector is inclined to leave ties in track unduly long it is natural for the foremen to defer to his judgment beyond the point where their own judgment indicates that the limit of safety has been approached. Furthermore, many trackmen resent the intrusion onto their tracks of a man from another division who may or may not be familiar with the local conditions and the peculiar nature of the service.

This latter condition is overcome in large measure by the second method whereby the roadmaster or his assistant who may be one of his experienced foremen selected for this purpose makes this inspection in common with the foremen. While adding considerably to the work of the roadmaster, it insures the inspection being made by a man familiar with the local conditions and in sufficiently close contact with the foremen to secure their co-operation. At the same time it tends to standardize the condition of the ties in track insofar as the roadmaster's district is concerned.

Present conditions require the adoption of some systematic method of determining tie renewals. The amount of money involved in premature renewals and the inherent danger in the opposite condition justifies the attention of the supervisory forces, in instructing and curbing forehanded foremen who will avoid the possibility of danger to the extent of removing ties before they have rendered full service, and the indifferent or frugal ones who will carry their ties to the point where the safety of the track is endangered. This is one of many details of maintenace of way work in which a greater amount of supervision is required today.

A TIME FOR CONSERVATIVE ACTION

FEDERAL CONTROL has exerted a marked influence on all phases of railway operation but nowhere has it been reflected more directly than in relation to labor. Prior to the time when the government took over the roads, the activities of organized labor had been confined in the main to the train service and mechanical forces and the unions had made relatively little progress in the maintenance of way and other departments. Through the use of the various weapons of the labor union, these organized employees had been able to wrest important concessions from the railway managers, both in wages and working conditions, to the disadvantage of their equally deserving but less aggressive fellow employees in the other departments. This created an inequality which neither the exertion on the part of the men nor the value of their work to the companies could justify. Government ownership advocates pointed to this condition as an evil peculiar to private control which would disappear under government operation, for a government would have every incentive to treat all employees fairly.

We have now had nearly two years of federal control. This period has been marked by concessions to labor without parallel in railway history. Wage advances aggregating over $1,000,000,000 per year have been granted, the eight-hour day has become an established fact, working conditions have been modified, etc. Labor organizations have flourished as never before, existing unions gaining access to roads which had been closed to them in the past, while employees previously unorganized have been encouraged to form unions.

In view of the liberal treatment accorded labor during recent months, one might naturally expect to find contentment and satisfaction among the employees. Yet the reverse is true in all departments. While large increases in pay have been meted out, the earlier discrepancies have not all been removed and some have been created. That the Railroad Administration has been unsuccessful in satisfying the demands of its employees is now evident to all.

While the unrest is no more pronounced in the maintenance of way department than elsewhere, it is more prevalent than ever before in this department and work is suffering in consequence. As a result, for the first time in the history of the maintenance of way department, organizers have been able to make considerable progress in gathering the men and the foremen into a labor union. Backed by this organization they have presented demands for large increases in pay, as outlined in another column, and a strike vote to enforce these demands is now being completed. The maintenance of way department is therefore facing the possibility of a general strike, a new condition which calls for careful consideration on the part of officers and employees alike.

The employees of the maintenance of way department have long held a deserved reputation for loyalty and

faithfulness, even when these were found wanting in other departments. They are now on test not only before their officers but even more before the bar of public opinion.

We do not challenge their right to ask for more money when other employees, already more liberally treated, are presenting new demands. But we are opposed to a strike or any similar measures which will interfere with railway operation. The public is insistent in its demand for a reduction in the cost of living and this will not be brought about by another cycle of higher wages. It can only come from increased production on the track and in the shop and factory. Strikes do not increase production but they stop it.

It is important that the older employees, who have most at stake, consider well any steps suggested in order that they may do nothing which will react against themselves, the roads which employ them and the country which gives them a home. It is said that this is the day of the radical, but indications are now pointing to his early elimination. Let conservative counsel prevail.

TWO NEW TURNTABLES

WHILE SWING bridges and turntables have much in common there is a wide disparity in the standards to which they are maintained. Rough handling and indifference on the part of the mechanical forces and disagreeable conditions encountered in making inspections and repairs are probably the foremost contributing causes of the trouble experienced in keeping turntables in proper condition. Designers have consequently striven to make the designs more sturdy, reliable and convenient for inspection and repairs. In view of this, a study of the turntables described on another page of this issue will be of direct interest to the men who are concerned in keeping this equipment in proper condition for the movement of engines to and from roundhouses.

The most vital feature of the table is unquestionably the center, with two distinct schools of design represented by those who favor the disc center with its simplicity of construction and ease of assembly and dismantling, and those who champion the more complex but easier running roller-bearing center. Valuable information is given in the description of the New York Central table relative to the reasons for adopting the disc-bearing center.

The end details of the table are also a source of considerable difficulty. Both of these tables are notable for the heavy construction of the end trucks which, of course, are much heavier in the case of the Pennsylvania table since the trucks of that design carry heavy loads while turning. Some idea of the problem this involved in this table is evident from the fact that it was considered necessary to provide a rail weighing 150 lb. per yard. for the circle.

For the man who has had any experience with crushed ties and circle sills, it will be a matter of no small satisfaction to note the special precautions taken in the Pennsylvania design to overcome this difficulty by the use of cast steel end ties on the table and cast iron copings on the wall. While the inspection pocket provided in the center wall of the New York Central table is a well known feature of the designs of some railroads, it does not seem to be as generally employed as might be supposed. The unique detail in this case is the provision for a jacking base directly in front of this inspection pit and another on the opposite side of the circle to facilitate jacking up the table at times that repairs are made.

LETTERS TO THE EDITOR

PAINT AS A FIRE RETARDENT

Whistler, Ala.

TO THE EDITOR:

As doubtful as it may seem, it is a fact, nevertheless, that a common oil paint may be employed to protect wooden structures against fire damage, especially in cases where a fire may originate from a falling spark. This can be demonstrated to the satisfaction of anyone who will take the trouble to make the experiment.

Procure a cypress or pine shingle and, beginning at the thick end, paint it half way with a thick coat of lead and oil paint or, preferably, a paint composed of linseed oil and a heavy iron base. After it has become thoroughly dry ignite the unpainted end and place the shingle at an angle of 45 deg. to facilitate the burning. When the fire reaches the painted portion it will die out, showing that the unprotected wood is far more inflammable than that with a painted surface.

By taking advantage of this peculiar physical property of paint through the painting of all wooden structures, especially wooden bridges and shingle roofs of station buildings along railway lines, it should be possible to effect a considerable reduction in the fire damage to structures subjected to sparks from passing trains or from coals of fire from locomotive fire boxes.

In painting a shingle roof with this end in view, it is preferable to apply the first coat of paint by dipping the shingles before they are placed. Then follow with a thick coat of paint and a liberal sprinkling of coarse sand while the paint is still wet. The sand will add materially to the fire retardent properties of the paint and will also prove a protection to the paint against the elements.

Many roof fires result from the fact that the shingles on an unpainted roof warp and form lodging places for flying sparks, while painted shingles retain their shape, thus offering a minimum refuge for sparks.

J. H. PITARD,
Foreman Painter, Mobile & Ohio.

NEW BOOKS

The Design of Walls, Bins and Grain Elevators, Third Edition, by Milo S. Ketchum, dean of the College of Engineering, University of Colorado; 6 in. by 9 in., 556 pages, illustrated, bound in cloth. Published by McGraw-Hill Book Company, 239 West Thirty-ninth street, New York.

This edition follows the plans of the earlier issues of this valuable treatise on structures subjected to the lateral pressures of earth and other materials. The new material consists of data on the economic design of reinforced concrete retaining walls, formulas for calculating the load on bin walls according to several methods, calculation of pressures in sand boxes, fully worked out problems in the design of retaining walls and bins and a report on the design of retaining walls adopted by the American Railway Engineering Association in 1917. The book contains chapters covering a general explanation of the theory of lateral pressures on walls and bins as expounded by various authorities, reports of various experiments and types of walls constructed with detailed explanations of retaining wall design as mentioned above, the design of coal bins, ore bins, etc., and the design of grain bins and elevators. There is also an appendix of about 70 pages on plain and reinforced concrete materials, design and specifications.

The Complete Outfit as Viewed from the Tool Car End

SOME NEW IDEAS IN BUNK CAR FACILITIES

Portable Quarters Provided for Small Gangs Embody Many Excellent Features

BY H. F. HAAG,
Signal Engineer, Kansas City Southern, Kansas City, Mo.

WHEN THE Kansas City Southern contemplated a signal construction program about one year ago, it was thought advisable to experiment with outfit cars of a somewhat better class than ordinarily used, it being felt that the experience gained as a result of such experiments should prove valuable in considering the question of providing better outfits for other gangs, such as bridge carpenters, extra gangs, etc. The results obtained have more than justified the slightly increased cost necessary to provide these improved quarters and have led to studies for further developments through providing for adequate heating for cold weather, hot water, facilities for recreation, etc. The principal thought in mind in providing these improved quarters for the men was that of cleanliness, comfort and sanitation.

GENERAL CONDITIONS DETERMINING TYPE OF CARS

No old passenger equipment was available at the time, but even if it had been possible to secure equipment of this type, it is doubtful whether it would have been used, as the idea in making this experiment was to improve the type of outfit ordinarily used rather than to develop a different class of car. Although it was necessary to take the cars as they could be had, an effort was made to secure those in a fair condition. If necessary a car was thoroughly overhauled and in some cases was rebuilt from the trucks up.

The first question to be decided was the number of cars required. Because of the shortage of cars at that time for commercial use, a careful study was made to determine the least number that would give the necessary accommodations without undue crowding, and it was finally decided that accommodations should be provided for 12 men per bunk car. It has since been found, however, that 2 additional double bunks can be placed in each car, giving accommodation for 16 men without serious objection, provided a car 36 ft. or longer is used.

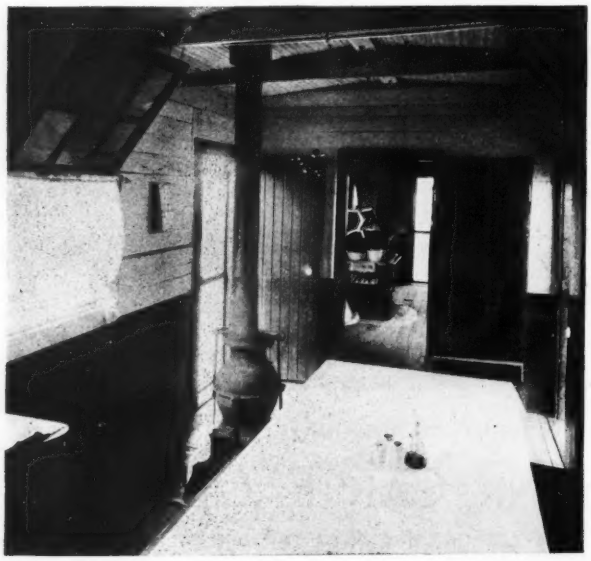
The manner in which the cars are kept is checked up closely and misuse of them or lack of cleanliness is not tolerated. The men have met this in the proper spirit and have co-operated to the extent that there is no complaint today that the cars are not being kept up as they should be. It was believed that in this experiment better results would be secured by having the men feed themselves rather than to have the commissary department handle this feature, and it was arranged accordingly for the wife of one man in each gang to do the cooking. The quality and quantity of food is determined by the men themselves and depends upon the amount which they pay, the railroad company having nothing to do with this arrangement.

After a thorough study of the subject, it was believed that four cars would take care of the average size gang very well and experience has proven this to be a fact. One of these cars was used as a bunk car, one for a kitchen and dining car, one for the foreman and cook and one for a tool and water car. By having the wife of one of the men do the cooking the outfit will accommodate 13 men or 17 men as compared with 12 and 16 if the outfit were run by the commissary department.

THE TOOL CAR

The tool car is made out of a box car of any length. A sufficient amount is cut off one end to provide space for a 1,500-gal. water tank. Next to this end there is a 6-ft. space for a bath room. This room has a floor covered with second-hand sheet metal, draining to the center, and has an old air tank placed on the roof for a water supply with a shower attachment under the ceiling. A mat of 2-in. by 1-in. material is placed on the floor and plenty of hooks and seats are provided for the benefit of those using the shower. This feature has proved to be the most appreciated of any of the innovations, as it adds greatly to the comfort of the men.

The tool room is lined with shelves and bins and there is ample space for work benches. The arrangement of this tool room provides a maximum space for the shelves and bins and also affords plenty of space for carrying



Interior of the Dining Car

the push and hand cars and heavy tools when the gang is en route. Because of the character of the work on which these gangs were employed, no storage space was necessary for materials, except such small supplies as could be stored on the shelves or in the bins.

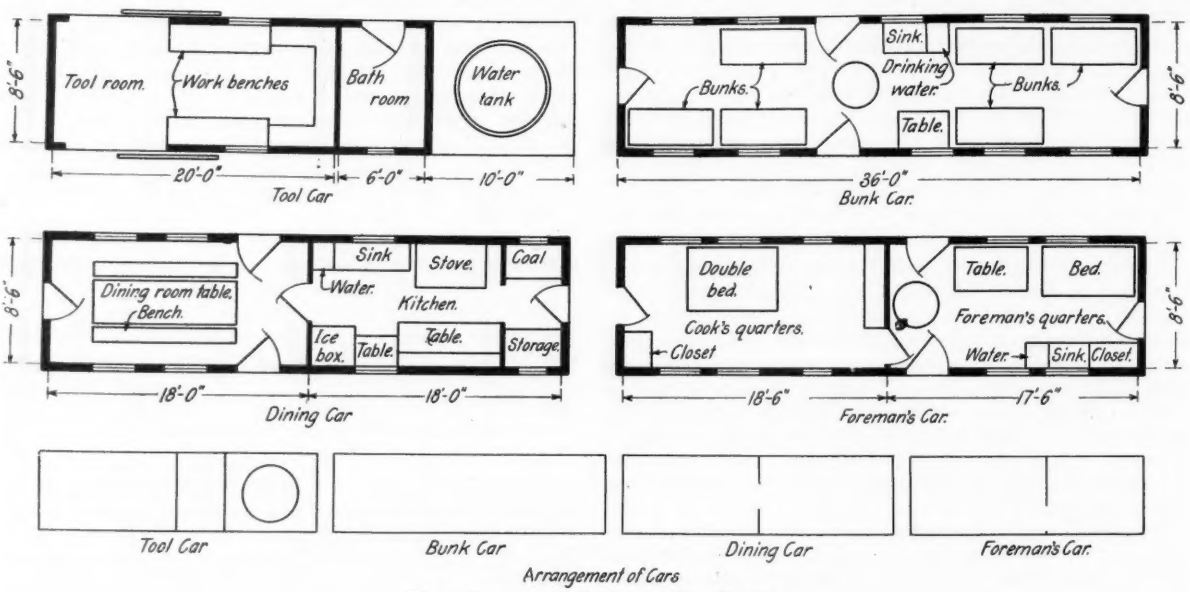
The bunk car has a double floor, the walls and ceiling are ceiled, and the windows are arranged to slide between the outer and inner walls. This obviates the unsightly appearance that results when windows are hung on the outside. The windows in the other cars are hinged at the top, swing upward into the car and hook to the ceiling when they are open. Plenty of locker and cupboard space is provided, together with the necessary chairs and tables. The beds are of a standard commercial metal type that does not require any mattresses and although capable of some betterment have given good satisfaction. One possible improvement would be the substitution of one-inch pipe posts extending from floor to ceiling for the chains that have been used, the objection to the chain suspension being that when the outfits are moved at night the chains permit of an uncomfortable movement of the beds. All of the cars are painted white above the chair rail, which is conducive to cleanliness and creates a pleasing appearance.

The bunk cars are required to be fumigated at regular intervals. The men furnish the bedding, and while this is contrary to general practice, it is believed that better results have been secured because it has been found that the men take very much better care of the bedding when it is their own, and as yet no complaint has been received from any of them because of having to furnish it.

In providing a water supply for these cars it was thought desirable to have the equivalent of running water. Tanks were, therefore, furnished and fastened to the ceiling with necessary connections and faucets over the sink. These tanks are so arranged that they can all be filled from the roof.

THE KITCHEN AND DINING CAR

The kitchen and dining car is divided approximately in half and it is so located in the outfit that the dining room end is next to the bunk car and the kitchen end is next to the cook's quarters in the foreman's car, so that in inclement weather no one need go outside of the cars except the foreman. An ice box capable of holding three days' supply is built in, as are the necessary shelves, cupboards and storage spaces. It will be noted in one of the illustrations that the dining room windows have curtains, which are provided by the men, and tend to create a homelike atmosphere. This, taken with the general cleanliness and neatness shown, makes an inviting looking dining room. The foreman's car is divided approximately in half, he having one end for his office and sleeping quarters, the cook having the other end. As these outfits are run by the men themselves, who buy their supply from day day, no large space has to be provided for commissary storage, and this permits the use of such space to increase the size of the cook's quarters. The

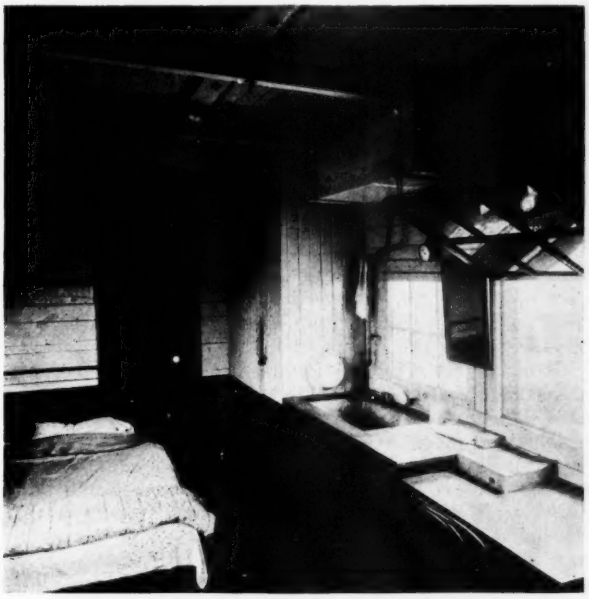


Floor Layout of the Four Car Outfit

entire outfit is screened and some of the end doors have been fitted with sliding screen doors instead of swinging ones to make travel between adjoining cars easier. Inasmuch as the rules prohibit the use of ladders or other means of access to these cars next to a passing or similar track, care is taken in spotting the outfits so as to permit them to use portable steps on one side of the cars instead of the ordinary vertical ladder. It is questionable at this time which type will finally be decided on as portable steps are more convenient, while a ladder permanently fixed to the car is safer. Each car is fitted with a coal bunker of two tons capacity, located beneath the car, which tends to conserve the coal as well as to make the supply more convenient.

GENERAL CONCLUSIONS

Because of the results that have been secured through providing these accommodations, the furnishing of better toilet facilities than are usually found is now being



The Foreman's Quarters

considered. It has been practically decided to install in the bathroom a type of waterless closet which has proven satisfactory in other locations, as it is believed that this will add still further to the satisfaction and well-being of the construction forces.

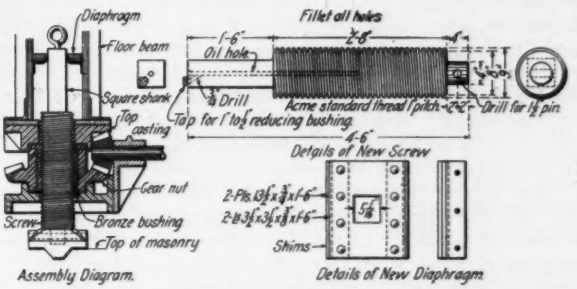
It has been found necessary to provide means of handling garbage and other refuse. While those in charge have insisted that this be taken care of in a satisfactory manner it is felt that it works more or less of a hardship and that a metal or a metal lined receptacle should be provided underneath the kitchen car which would be accessible both from the kitchen and from outside the car.

The average cost of fitting up one of these four-car outfits is approximately $950, of which it is estimated that one-third represents the cost of the innovations described above. As a result of the experience with this equipment, the officers of the road believe that they would be justified in spending even more than this amount in order to secure the satisfactory results obtained. It should be borne in mind that this cost is based on an average run of cars and that the cost will be decreased or increased, depending upon whether the cars are better or worse than the average.

The officers are so well satisfied with this experiment that they seriously consider carrying it still further by providing equipment for an average extra gang. For this outfit it is felt that one car should be set aside for a recreation room where the men can congregate in the evening to read, play cards or indulge in other relaxation. Provision for adequate heating facilities will also be considered to replace the ordinary caboose stove, which, as it is well known, will heat up the car in its immediate vicinity, while leaving the more remote parts cold.

CORRECTING A DEFECT IN THE END LIFT OF A DRAW SPAN

TROUBLE WITH THE end lift of the Cuyahoga drawbridge of the New York Central at Cleveland recently necessitated the renewal of certain parts at which time opportunity was taken to modify some of the details to overcome the fault responsible for the trouble. The bridge is a swing span carrying all passenger trains of the New York Central and the Big Four entering or leaving Cleveland in addition to Pennsylvania ore traffic and much switching, while the boat traffic on the river is such that the bridge has been swung as many as 4,500



The End Lift Machinery as Modified

times in a single month. The repairs in question were made without any interference with either the rail or river traffic movements.

The end lift machinery of this bridge is of the type known as the ram screw, in which the ends of the bridge are raised and lowered by means of a gear nut at each corner of the span which turns up or down on a forged steel screw of nine inch outside diameter. The ram or screw remains stationary and has a bearing casting at the lower end to rest on the ram seat, which is anchored on the masonry, while the nut, also of cast steel, has a phosphor bronze bushing threaded to engage the ram. This nut is turned by bevel gearing from a 3½-in. line shaft on the bridge. It serves to raise the bridge by having its top surface in contact with a cast steel top end bearing, one of these bearings being attached under each end of the floorbeams at the base of the end posts at each end of the bridge. Thus the load on the ends of the bridge is carried from the floorbeam into the end casting, thence by direct bearing to the gear nut and from this through the threads to the ram which in turn transmits the load through the bearing shoe to the masonry.

The top end casting as originally planned served a further purpose in that it kept the ram from turning with the nut. This was accomplished by slotting the ram on diametrically opposite sides to a width of 1⅝ in. and a depth of 9/16 in. and providing corresponding keys in the top casting. This feature is what caused the trouble. The shoulders formed on the threads by these slots tended to cut the threads of the nut, particularly when cinders and other foreign particles lodged there, and led to failure

of the threads. Consequently, it was considered advisable, when replacing these gear nuts with new ones, to modify the design if possible so as to hold the ram against turning without the necessity for slotting the threads. This was accomplished by providing the new rams with a five-inch square shank on the upper end 1 ft. 6 in. long, while a diaphragm was introduced in the end floorbeam directly over the ram provided with a corresponding square hole so that the shank of the ram could slide up and down through the diaphragm and be held against turning. The drawing illustrates how this was accomplished.

We are indebted for the above information to R. H. Reid, supervisor of bridges, New York Central, Western Lines, Cleveland, Ohio, under whose supervision the replacement was made.

The Essential Duties of the Trackwalker

BY W. F. RENCH

THE PATROLING of the track is the essential duty of the trackwalker. It is necessary that the conditions of the railroad should be observed frequently in detail. Many parts drop from cars in transit, and must be removed promptly; car doors and even roofs are blown upon adjoining tracks where they may be very likely to cause accident; objects protrude from cars standing on sidings, which may cause personal injury. The track structure is subject to sudden defects whose presence cannot be anticipated. Many rail failures are preceded by signs of weakness which a watchful eye can detect; in warm weather the track may buckle suddenly from expansion; in cold weather it may pull apart from contraction. To protect against such obstructions the trackwalker should always be provided with a red flag, and he should also carry torpedoes and fusees. He should fully understand the use of signals, and he should be prompt to supply the necessary protection.

The incidental duties of the trackwalker are to tighten the odd bolts he finds loose and to replace any that are broken or missing; to tap down the spikes that are beginning to come up in face; to gage in a rail that is commencing to spread; to discover and replace cracked splices before they become dangerous; to look over frogs, switches and guard rails; to repair broken bond wire connections; and in general to observe and correct everything that concerns the safety of the track. He should repair promptly such defects as he can, and bring to the attention of the foreman those that are beyond his means.

An important duty of the track watchman is to see that switches are set and locked for the main track and, in the event the lock is found damaged or missing, to supply a new one immediately. He should also see that the telephone boxes along the line are properly closed and locked. It is usually his duty to clean, fill and light the switch and derail lamps. He should make sure there is oil enough in the fonts to burn the required time, that wicks are adjusted to give a clear light without smoking, and that the lamps face so as to present a good indication to the engineer. When derails not connected with the main track switches are in use he is required to see that they are thrown properly if any cars are standing in the siding. When derails are not used he should note whether the cars are fully clear the main track and make sure that the brakes are applied. In case he finds cars pushed off the dead ends of sidings he should report the matter promptly. He should examine the cars along the main track to ascertain that car doors are properly secured and that no other obstructions decrease the intertrack clearance.

He is required to examine buildings and other property of the company and protect them from fire and other damage. At certain stated times he is required to sweep off the cinders accumulating on the station platforms, and in some cases it is necessary that he should clean, fill and light the platform lamps. In the winter season he must sprinkle salt upon the platforms at isolated stations to avoid accident to passengers. He should not be overburdened, however, with duties incident to the care of stations.

He should know the limits of the company's ground so he can warn off trespassers, and he should report to the foreman when he finds anyone using the right of way improperly. He should be alert to extinguish grass fires before they gain headway. He should be careful to put out fires burning in the ties, as this will not only save the company the cost of new ties, but the labor of putting them in the track, which is one-third the cost of a new tie. By burning old paper, old waste, leaves, etc., he can do a great deal toward making the railroad look tidy. He should watch for openings in the right-of-way fences through which cattle might enter upon the railroad, and either repair them temporarily or call them to the attention of the owner. It is very important that the trackwalker should acquire and keep the good will of the farmers along the line.

It makes for efficiency if the trackwalker is careful to note the low joints and deficient line. It is not expected that he should observe the detailed line and surface, for that is the foreman's duty; but he should report when track is becoming rough, so that the defects can be promptly corrected. Whenever possible he should tamp the low joints, and he should especially see to it that insulated joints are tamped frequently. Unquestionably the detailed repairs made by the trackwalker are the means sometimes of averting an accident. For this duty he should be equipped with a hammer and track wrench, and a bag containing some spikes and bolts, as well as fusees, torpedoes and a red flag.

The duties of the night patrolman are necessarily restricted to the actual patroling of the road. To require him to make any repairs would expose him to too great a risk, his danger being considerable even under the most favorable conditions. To minimize the danger he should carry a protector lantern with a light shining from the rear so an engineer can discover his presence. This light should be so arranged that it can be changed in a moment to a stop indication. Safety rules require that he shall always travel facing the direction from which trains normally come, but since they may be operated against the current of traffic, he should keep a sharp lookout in both directions. He should be especially watchful in crossing the tracks.

Except in isolated situations, there does not appear to be any need to check a day trackwalker by clock or otherwise, but this may be required in the case of the night patrolman. The clock system is the most satisfactory means of recording the observance of the established hours, but tests should also be made to determine that the patroling is not of a perfunctory character. These tests are not required in the case of the day man, as he is constantly under the eye of everybody, and his work

can be gaged by its results. Where the duties of day watchmen are solely that of patroling dangerous points, the clock system should be used. In the event of a slide causing an accident a record will be required to prove that the tour had been faithfully followed.

Both the day and night patrolman should be experienced track men and they should be possessed of good intelligence. The occasion may arise at any moment when they will have to determine quickly upon a course of action. Especially should they be alert to protect the track most immediately endangered. They should be prompt to call the foremen and men when a sudden emergency, such as a snow or heavy rain storm, requires their attendance.

The day or night watchman may be called upon to minister to an injured person found along the tracks. He should have some knowledge of first aid, as he may thus be the means of saving a life. He should take prompt action to notify the superintendent from the nearest telephone in order that the injured one can be taken by first train to a hospital. In electrified sections it is especially important that he should have a working knowledge of resuscitation from shock. It is by virtue of the many important duties required of him that the trackwalker can reasonably aspire to ultimate promotion as assistant foreman and foreman, and the supervisor should give due weight to his service in the lower but none the less responsible position.

The Heat Treatment of Track Materials*

BY C. B. BRONSON

THE FUNDAMENTAL basis for successful heat treatment is sound steel. This implies not only structural soundness and freedom from blow holes, pipes and inclusions, but chemical and physical homogeneity as well. Heat treatment of unsound steel probably does more harm than good, for even the best steel is put to a severe test during the quenching operation, while unsound or segregated metal may be easily fractured or weakened.

Of the great number of steel materials used on railroads, perhaps none has been more widely discussed than the rail. The development of the rail section is an intensely interesting story of evolution and improvement, and it is therefore only natural that many researches have been conducted to improve its quality by heat treatment. Most of the work attempted has been experimental in nature on short length pieces, and not on full length rails. Many influences have retarded development of the latter, chief of which is the outlay and expenditure required to produce large tonnages, especially when it is recalled that present rail mills produce from one to three thousand tons of untreated rails daily. Furthermore, there is the question of higher cost, as well as the relative efficiency and reliability of treated versus untreated rails.

Probably for general service requirements, where properly designed sections are used, it will be a long time before the present efficient plain carbon basic open hearth steel rails will be replaced as standard for most of the roads in this country. Basic open hearth rail, under our present elongation and exhausted ductility test, making it possible to obtain nearly all the ductility due to the chemical composition, is a wonderfully efficient product with a low rate of failure, and moderate rate of wear.

The simplest process for heat treatment of rail steel, of course, is the air-cooling method introduced by one manufacturer. This consists of an air blast blown from numerous small openings in a straight pipe, and directed against the top surface of the rail head; the blast being maintained for about two minutes, after which the rail is allowed to anneal in air. The head surface metal becomes sorbitic for a depth of about one inch and shows a Brinnell hardness of 300-350; elastic limit, 90,000 lb.; tensile strength, 140,000 lb., and 8 per cent elongation. The balance of the head metal is pearlitic in structure with a Brinnell hardness of 240; elastic limit, 60,000 lb.; tensile strength, 125,000 lb., and 10 per cent elongation. The carbon runs from 0.50 to 0.65 in this steel, which is made from Mayari ores.

*Abstracted from a paper presented at the June meeting of the New York chapter, American Steel Treaters' Society.

A number of patents have been issued to one company covering a combined oil and water treatment. The treatment consists in passing the finished hot rails, head down, into a series of quenching vats so constructed and regulated that the head only is treated in the first oil bath; passing them to the second vat where the head is immersed in water and the web in oil. In the third vat both head and web are in water, which completes the treatment. One modification of the process provides a spray to force the water against the rail head, instead of merely drawing it through the bath. A troostitic structure is obtained on three sides of the head, which tapers on into martensite for the balance of the head section. Drop and hammer tests on rails so treated indicate great toughness and ability to withstand severe shocks without failure.

The composition and physical properties obtained after treatment are about as follows:

Carbon	0.40	Tensile strength	190,000 lb.
Manganese	0.50	Elongation—2 in.	11 per cent
Silicon	0.25	Red. of area	30 per cent
Sulphur—max	0.04	Brinnell—head	420 per cent
Phosphorus—max	0.04	Brinnell—web and flange	200 per cent
Elastic limit	120,000 lb.		

One manufacturer found it necessary to redesign the standard section to heat-treat successfully rails made of Mayari steel. A section, similar to the present "B" type 100-lb. rail, was used as a basis, and to this was added 21 lb. by providing very generous fillets between head, web and base and also increasing the thickness of the latter. The mechanical properties were apparently not given precedence in the design, as they are low for this weight of rail. The design was adopted to obtain uniform physical properties, provide relief and reduction of cooling stresses, and to utilize a set of rolls which were on hand. The treatment used was experimental, and therefore the details are not generally known.

The composition and physical properties obtained after treatment were as follows:

Carbon	0.33	Elastic limit	115,000 lb.
Manganese	0.33	Tensile strength	140,000 lb.
Nickel	1.30	Elongation—2 in.	8 per cent
Chromium	0.50	Red. of area	15 per cent

Under the drop the test pieces withstood from 6 to 12 blows before fracture, when a 2,000-lb. tup was dropped 25 ft. on supports 3 ft. apart.

One or two of the eastern roads with very heavy traffic conditions secured several of these rails, and will probably be in a position in the very near future to report upon the success of the experiment.

The only alloy heat treated rails which have been made

and purchased in large numbers are manganese steel rails. Those of early manufacture developed breakages with great frequency, but this difficulty has since been overcome, as a number of changes in manufacture were introduced. The New York Central purchased several hundred tons of these rails four years ago, and since that time they have carried over 100,000,000 tons of traffic without one failure and at a remarkably low rate of wear —an exceptionally good record. From present indications, they should outlast plain carbon steel rails in the ratio of ten to one.

The wonderful toughness inherent in manganese steel makes its use particularly inviting for rails on curves. Our present practice is to place them on the high side of curves with plain carbon rails opposite, generally reversed, curve worn high rails, which make the best combination. The susceptibility to flow prohibits their use on the low side of curves, especially where the tendency to widen and flatten under the wheels of present improper contour is very great.

The 6-in., 105-lb. Dudley type rail is the only one which the New York Central has had rolled in manganese steel. This is a broad head, stiff section, possessing high mechanical properties which are necessary when using metal with such low elastic limits. Any road contemplating the purchase of manganese rails is advised against ordering them rolled in light sections, for the combination of the low elastic limit and deficient mechanical properties make it easy for them to acquire permanent sets in service, creating rough riding track, and may eventually be the cause of derailments. Manganese rails injured by truck derailments from causes other than roughness of track, are badly bent out of shape, although they remain unbroken. It is necessary to scrap the rails, as they cannot be straightened by any known method.

The composition specified for rail steel is as follows:

Carbon	1.00 to 1.35	Phosphorus, max.....	0.10
Manganese	10.50 to 15.00	Sulphur	Not specified

Tests for the physical properties are made by the usual drop test; the toughness and tenacity of the material being so great that several blows of the 2,000-lb. tup falling 20 ft. are required to exhaust the ductility, which frequently runs as high as 25 to 30 per cent per in. A load deflection test is made upon a full length rail supported at the ends and loaded by means of a scale pan at the center. Elastic limits found in this manner are close to 35,000 lb. per sq. in., which is a more reliable index than can be secured from tensile test specimens burned out of the rail section and ground to size. The results are always high by the latter method and therefore are not used.

The return of normal conditions should see an increasing amount of manganese steel rails placed in service, for there is no question about their superiority for overcoming curve wear to which our present rails quickly succumb.

It is well to mention, in passing, the successful use of manganese steel for frogs, crossings, and switch point tips. Their resistance to wear is similar to that of manganese rails, and they are used quite extensively. The tendency to breakage, however, is somewhat greater in the cast steel parts than for rolled rails.

Two heat treated track materials purchased in large quantities are rail splice bars and track bolts. Splice bars are made to the following chemical and physical requirements:

Carbon	0.45 to 0.55	Elastic limit....	65,000 to 72,000
Manganese	0.30 to 0.50	Elong. in 2 in...	12 per cent min.
Phosphorus, max.....	0.04		

In manufacture, the bars are sheared to length, reheated to about 800 deg. C., hot punched and quenched at 700 deg. C., or over, then subsequently reheated or withdrawn from the oil bath for tempering. The high elastic limits obtained place them on the same level as rail steel so far as physical strength is concerned, and increase their resistance against permanent sets, and sagging at the joints.

Track bolts when heat-treated show elastic limits of 70,000 lb. and over when made of about 0.30 carbon steel. These high limits provide additional strength against stretching when tightened with the trackman's wrench, and becoming loose due to the transmission of stress at the rail ends, and the impacts from wheel loads. The usual process for heat treating consists in rolling the threads hot, then allowing the bolts to drop into a bath of oil and finally discharged into a hopper from an endless chain. Heat treated bolts are in extensive use and giving satisfactory service.

A TIMBER SMOKE JACK

WHILE TIMBER has been used to a greater or less extent in the construction of roundhouse smoke jacks for many years, one of the recent developments has been that of a jack of kiln-dried California redwood, thoroughly treated and fireproofed before fabrication. It has the advantage of being light in weight and easy to handle and is furnished knocked down ready for assembly by unskilled labor. No nails or fastenings are exposed to the smoke or locomotive gases. The jack is built of mill construction, the details of which are clearly shown in the drawing. It is supported in place by a simple collar resting on the roof and requires no guy wires or other supports. In operation, the jack presents a large ventilating area and it may be equipped with an automatic damper if desired. It presents smooth surfaces inside and out, which, with the absence of supports, are reflected in the low cost of maintenance. The jack is manufactured under the trade name of Mill Type Smoke Jack by the Smoke Jack Company of East Boston, Mass.

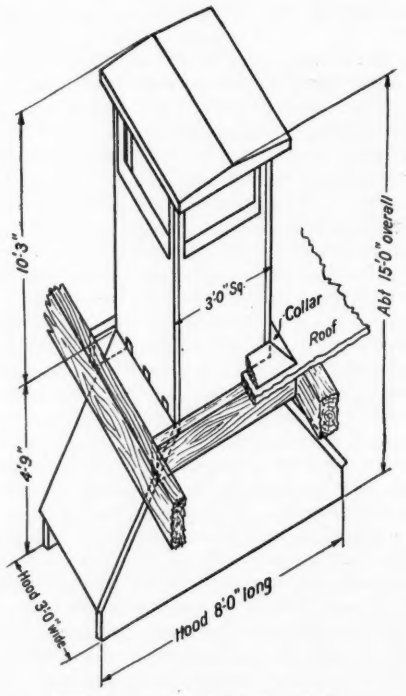


Diagram of the Smoke Jack

Photographs by courtesy of W. A. Welch, formerly Major, Aircraft Production Board, Portland, Ore.

BUILDING RAILROADS IN OREGON CONTRIBUTES TO MILITARY SUCCESS IN FRANCE

United States Soldiers Built 350 Miles of Standard Gage Main and Branch Lines in Western Forests Last Season to Get Out Spruce for Air Plane Construction

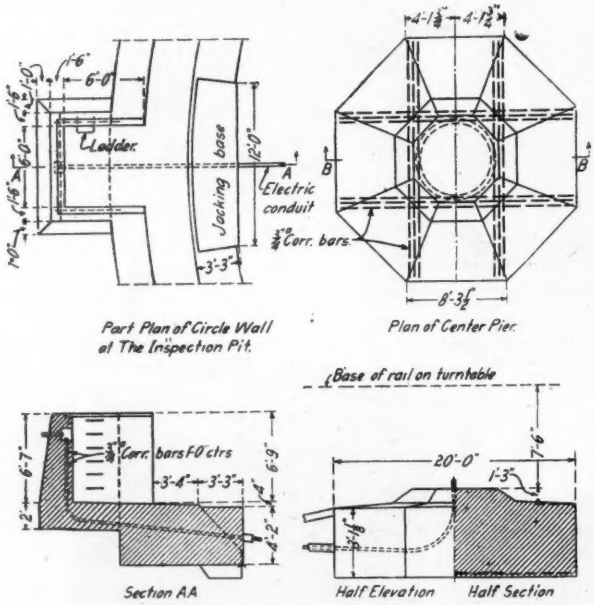
RECENT EXAMPLES OF TURNTABLE DESIGN

Descriptions of Widely Varying Types Developed by Two Railroads During the Past Year

TWO NEW DESIGNS of turntables have recently been prepared by different roads, differing from each other and from the commonly adopted forms of construction in several important respects. One was built by the New York Central, Western lines, and has a disc-bearing center; the other by the Pennsylvania Railroad with a roller bearing center. The former is a center bearing, rocking table of the usual type, while the latter is of a continuous girder design, i. e., the table is built to support its load at three points, on the center and on the trucks at each end, not only while the engine is moving onto or off the table, but while the table is swinging.

THE NEW YORK CENTRAL DESIGN

The New York Central turntable is 100 ft. long and is of particular interest because of the reasons given for adopting the disc type of center. Briefly, continuous service and low maintenance cost were considered more important than ease of turning and therefore low operating cost. It has been the experience on this road that under present heavy loadings the roller centers used have been too highly stressed, causing rapid grinding and wear

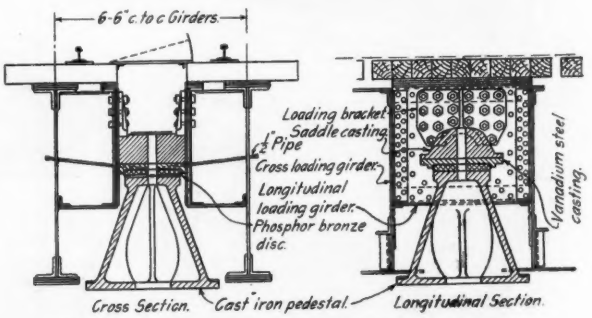


Details of Circle Wall and Center Pedestal

of both rollers and treads with the result that replacement has come too soon. It has also been found that the roller centers used have required more frequent and careful inspection and maintenance than they have received from the roundhouse forces, with the result that their operation was not satisfactory. While the roller centers unquestionably turn easier than the disc centers when new, it was found that poorly-maintained roller centers did not turn as easily.

In connection with the turntable, special attention has been given to the requirements of the tractor. It was felt that it is a serious mistake to provide a tractor of too limited capacity, for when it is out of service 15 to 20 men may be required to turn the table. It is believed that with proper attention to this subject there is no more occasion for tractor failures on turntables than for failures of the motive power on movable bridges. The tractor required for these table is specified to provide a tangential pull of 1,725 lb., this being the initial friction estimated for a total load on the center of 842,000 lb.

The disc of the center is flat and has only one rubbing surface. A vanadium steel bearing casting is attached to the under side of the turntable saddle and this bearing



The Center and Method of Supporting the Table

casting turns on a flat phosphor-bronze disc two feet in diameter which is attached to the center pedestal. The vanadium steel bearing is attached to the saddle casting by bolts, while the disc is secured against turning on the pedestal by means of keys.

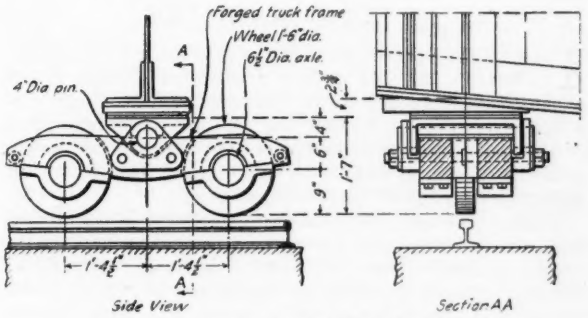
Special attention was given the manner of lubricating the contact between the vanadium steel and phosphor-bronze surfaces. Graphite grease is used for this purpose, being introduced into grooves cut in the surface of the vanadium steel through half-inch pipes leading from grease cups located outside the girders. Grease has been used because it was felt that for slow motions and heavy pressures a thick lubricant would be better than oil, since it has less tendency to be squeezed out of bearings.

The table is supported on the center through the use of a pin bearing. The two interior loading girders transmit the load of the turntable to the center through the aid of two brackets resting on trunnions forming a part of the saddle casting. As a consequence of this arrangement, the turntable may rock with the passage of a locomotive over it.

The forged steel end carriage is another interesting detail, an important feature being the articulating arrangement whereby an even distribution of the load on the two wheels is obtained. The middle of the frame carries a four-inch pin which takes the load from the girder in direct bearing through a cast steel shoe bolted to a bevel plate on the bottom of the girder. The shoe has a groove 4 in. in diameter bored in its under side to fit over the pin, thus affording an effective rocker joint with a bearing 1 ft. 7 in. long. The wheels are of cast steel 1 ft. 6 in. in diameter and 4 in. thick with forged axles 6½ in. in diameter.

The circular wall is provided with a large inspection pit 6 ft. square by 6 ft. 9 in. high and a jacking base is

introduced on the circle wall footing directly in front of the inspection pit and also circumferentially opposite so that the table may be jacked up for a more thorough inspection or for the replacement of the end trucks. The total weight of the turntable is 171,927 lb., of which 145,-



The New York Central End Carriage

720 is structural steel in the girders and cross frames, etc., and 26,207 lb. in the special castings, forgings, bolts, etc. The design of this table was developed under the direction of B. R. Leffler, engineer of bridges, New York Central Lines West of Buffalo, at Cleveland, Ohio.

THE PENNSYLVANIA TURNTABLE

The Pennsylvania table is 110 ft. long and is designed for such heavy loads that a table of the balancing type would be heavy and deep, entailing the use of a deep turntable pit. To overcome this and other obstacles the table was designed to carry its load at both ends as well as the center. This arrangement also does away with the necessity for balancing the locomotive over the center of the table when turning. The design was also improved by a desire to have a table that could be turned end for end in 60 sec. In accordance with this desire two tractors have been provided, one at each end of the table.

THE CENTER

In order that this table should function properly on its three points of support it is necessary that one of the supports be adjustable so far as the vertical alinement is concerned. This adjustment is accomplished in the center by means of screw-operated wedges, the total range of adjustment being one inch. As the load of the table comes down on the sole plate it bears on wedges, which in turn, through their wedge castings, bear on the equalizing hinge pin, thence on the thrust bearing proper. This thrust bearing is of the roller type with a babbitt liner between the lower roller race and the center casting to insure uniformity of bearing pressure.

The capacity of the center bearing is 860,000 lb. and it is fully grease lubricated. It has been designed and built with a view of making it accessible for inspection or repairs. The upper half of the center proper can be removed from the base casting and the entire center slid out of position and passed up through the deck of the table; to perform this operation it is necessary to jack up the table approximately three inches. All the adjustment wedges and the wedge screws are thoroughly protected against corrosion and grit. The center is all of steel except for the housing shell, which is of cast iron.

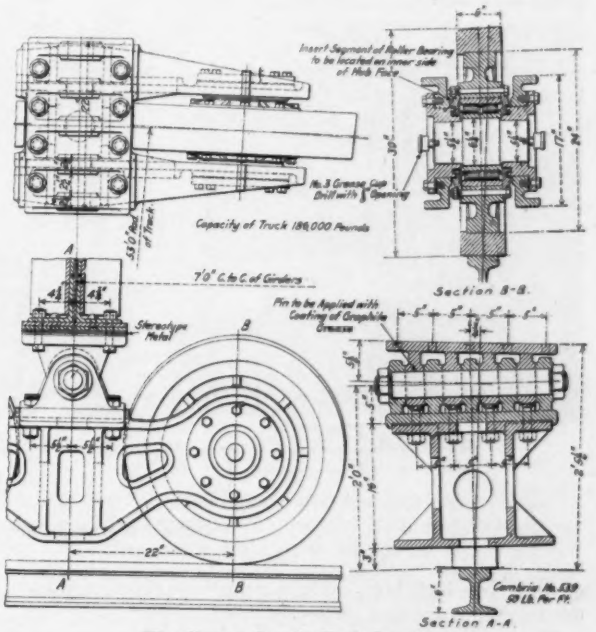
There are three points of particular interest in connection with the tractors and their control. The motor on each tractor has a capacity of approximately 30 hp. each. This is considerably more power than is used on the ordinary type of table, but since a table of this kind does require more power for operation than one in which the locomotive is balanced on the center bearing, and since the operation is fast and must always be dependable, one tractor working alone can be used to operate the table in an emergency. The motors are equipped with solenoid brakes, which are applied instantly when the controller is moved to the "off" position and are released automatically when power is applied. With this type of table the solenoid brakes make it possible to operate the table without any of the so-called locking devices to hold it in alinement with the approach tracks.

In case of accident to either motor or to any part of the driving mechanism, electrical cutouts are provided for cutting the damaged motor out of service without affecting the operation of the other motor, while the solenoid brakes can be blocked in the "off" position. A motor may be disconnected mechanically by removing the split main gear or by removing the motor itself.

The two tractors engage the table through ball and socket connections located at the end of the stabilizing arms. All bearings of the tractors are grease lubricated. The tractor weighs approximately 23,000 lb. in working order, giving a total tractive effort of 12,000 lb. per table.

The end trucks on the table are of the cast steel frame type with hinge connection centers. All truck wheels are 30 in. in diameter, coned, with steel-tired treads and cast iron centers. They are provided with roller bearing centers with the bearing enclosed in a labyrinth casing, the details of which will be clear from an inspection of the truck drawing. The trucks are fully grease lubricated.

The truck hinge castings as well as the end steel ties on top of the girder are lined to the girder flanges by



The Pennsylvania End Carriage

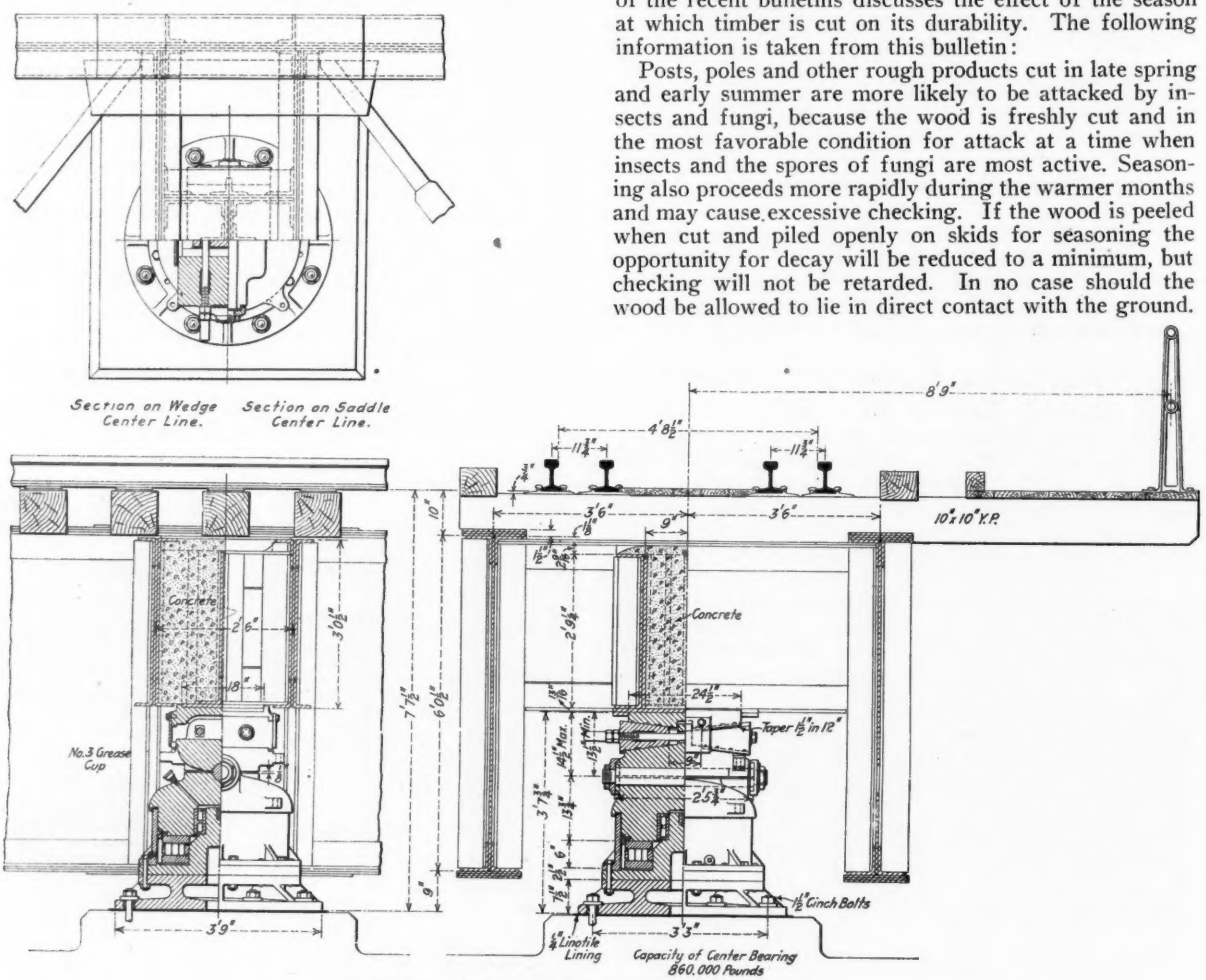
means of stereotype metal. The trucks each have a capacity of 186,000 lb. and travel on the same circle rail as the tractors. They may be removed by taking out the hinge pins located in the hinge casting at the girder.

COPING WALL

In order to insure that there will be no settlement at the coping wall on account of pounding due to the engines, cast iron coping castings were employed instead of wooden sills. These castings are arranged one for each approach track and are thoroughly embedded in

concrete and bolted thereto. These coping castings are accurately alined to the approach tracks and weigh about 9,000 lb., are 5 ft. 6 in. long, 12 in. deep and 30 in. high.

To eliminate the pounding out of the approach rails and approach rail supports at the table ends and at the approach rails, cast steel end ties were installed at the ends of the turntable bridge and cast iron coping castings were used on the coping wall, the cast steel end ties being lined to the exact center line of the turntable bridge and brought to alinement and level by means of stereotype lining between the end tie and the girder flange plate and secured to the turntable bridge by means of eight one-inch bolts. Diametrically opposite tracks to the turntable are also perfectly lined.



Details of the Pennsylvania Turntable Center

The circle rail on which the trucks and tractors run is 106 ft. in diameter and is of 150-lb. section, supported on 33 support castings, each 9 ft. 4 in. long, 10 in. high and 12 in. wide and made of ⅞-in. material. The end cast steel ties on the bridge have a maximum depth of 12 in., a minimum width of 8⅜ in. and a flange width of 5 in., and are made of one-inch material. They support both the traction rail and the guard rails and are lined to the bridge girders by means of ⅜-in. stereotype lining.

The design of this table was developed under the direction of A. S. Vogt, mechanical engineer, now retired on age. Tables of this type have been installed at Pitcairn, South Philadelphia, Erie, Kane and Renovo, Pa., and at Gardenville, N. Y. Others will be installed in the near future at Wilmington, Del., Youngwood, Pa., Pitcairn, emergency table, and at East Altoona.

EFFECT OF TIME OF CUTTING TIMBER ON ITS DURABILITY

THE UNITED STATES Forest Products Laboratory, Madison, Wis., is issuing a series of Timber Notes containing the results of its research studies of various problems arising in the handling and use of timber. One of the recent bulletins discusses the effect of the season at which timber is cut on its durability. The following information is taken from this bulletin:

Posts, poles and other rough products cut in late spring and early summer are more likely to be attacked by insects and fungi, because the wood is freshly cut and in the most favorable condition for attack at a time when insects and the spores of fungi are most active. Seasoning also proceeds more rapidly during the warmer months and may cause excessive checking. If the wood is peeled when cut and piled openly on skids for seasoning the opportunity for decay will be reduced to a minimum, but checking will not be retarded. In no case should the wood be allowed to lie in direct contact with the ground. If checking is an important consideration it can be reduced somewhat by locating the piles in a shaded but dry place. The bark peels most easily in spring.

Timber cut in the late fall and winter seasons more slowly and with less checking than during the warmer months, and when proper storage or handling is impracticable, winter cutting is best. Fungi and insects do not attack wood out of doors in cold weather and by the time warm weather arrives the wood is partly seasoned and somewhat less susceptible to attack. It is for this reason that winter cutting is advantageous and not on account of a smaller amount of moisture or sap in the wood in winter as the popular belief has it. There is practically no difference in moisture content of green wood in winter and summer.

PENNSYLVANIA HAS NOVEL TREATING PLANT

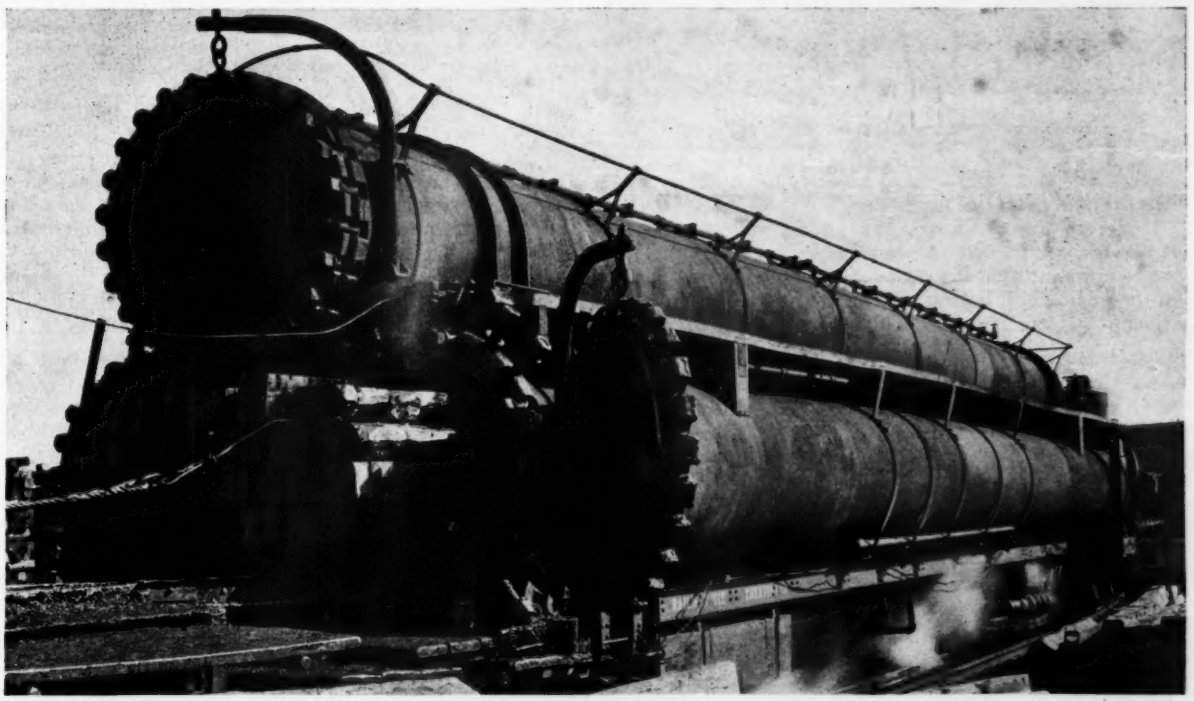
With Its Equipment Mounted on Cars the Entire Outfit May Be Shifted at Will

A PORTABLE tie treating plant designed with the view of moving the plant to the ties rather than the usual method of transporting the ties from the source of supply to the plant and then to the point of of application, has been in successful operation on the Pennsylvania Railroad for the past 18 months. Such a plant is particularly adaptable to districts wherein a large proportion of the ties used are purchased locally and stored along the right of way to season. However, the distribution of ties has been so dislocated in recent months that the plant on the Pennsylvania has operated continuously in the Mt. Union (Pa.) tie yard, where, in 1918, 276,156 ties were treated, adzed and bored at a cost, exclusive of royalties, rentals, etc., of $0.1211 per tie.

Essentially the plant consists of a car housing the power plant and adzing and boring machines, two cars carrying tracks on which the retort cars travel and a car for the treating cylinders. All of these cars are built specially for their particular purposes and are arranged in the train in the order named. The train may be moved from one locality to another as any other train, clearances having been maintained in the design of cars, or it may be moved locally under its own power, the adzing and boring car being equipped with the proper gearing for this purpose.

The adzing car, in addition to containing the adzing and boring machines and conveyors located in one end of the car, furnishes space for a 60-hp. gas engine, a stationary boiler of 50 hp. for generating steam for the operation of the pumps on the treating car, fuel storage for the boiler, tanks for gasolene and kerosene, a bench gainor knife setter, bench grinders turned by a small gas engine, and a work bench for general purposes. The bailer is located in the far end of the adzing car to keep the fire as far as possible from the creosote. The shavings and borings are conveyed away from the machines and are used with coal for fuel under the boiler.

The track cars, two in number, are 50 ft. long with two tracks for the tram cars on their deck, with two additional tracks raised on steel frame work to the elevation of the upper cylinder on the treating car. A ball bearing gravity roller conveyor extends alongside the adzing car leading from the machine to the first track car, which is supplied with turntables at the end adjoining the adzing car. Switches at the end of the second car adjoining the treating car permit flexible operation of the tram cars, it being possible to discharge from either cylinder to either side of the track car as occasion demands.



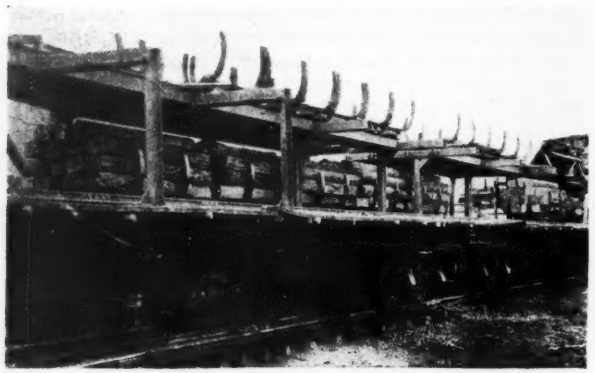
The Three Cylinders Mounted on a Car

One of the photographs show the arrangement of the treating cylinders on the treating car. As may be seen, two are placed on the deck of the car with the third superimposed. The treating car equipment consists of two pumps and the necessary gages and valves, one a low pressure pump working to about 200 lb. and used for pumping creosote into the cylinders, and the other a high pressure pump (600 lb.) used for treating purposes. Steam coils carried on the inside of the cylinders through which all exhaust steam passes serve to heat the creosote.

Each cylinder is supplied with oil sprinkling or spraying apparatus consisting of a main pipe, 2 in. in diameter, run-

ning the full length of cylinders with smaller pipes leading into the cylinders to spray the creosote over the ties. The creosote for the plant is furnished in tank cars, which are spotted beyond the cylinder car, and which, with little trouble, can be connected up with the pumping apparatus on the treating car.

The cylinders are 4 ft. in diameter and 63 ft. long, or sufficient to admit seven tram cars with their loads, which

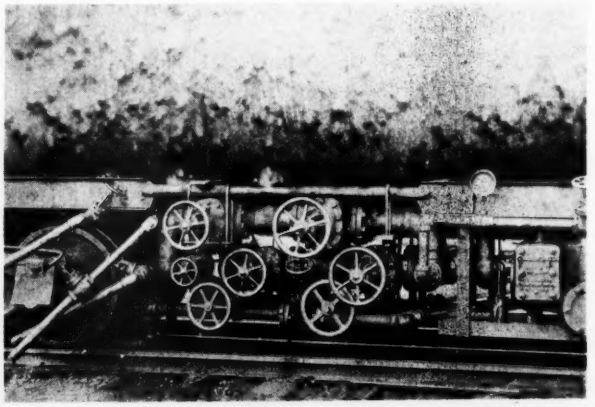


Two Decks on Cars Carrying Retort Tracks

average 100 ties. Running to capacity the outfit is capable of treating 100 ties per hour.

Under normal conditions the force employed consists of two men on the treating car, one to run the pumps and one to open and shut the doors of the cylinders, three men on the adzing and boring car, including an engineman, a fireman and an operator at the adzing and boring machine, and eight laborers. The engineer is in charge of operations, including general repairs, and supervises the labor forces.

In operation the ties are conveyed from the ground or piles to the adzing machine, where they are shaped for tie plates, after which they pass on to the boring machine and then out to the gravity roll conveyor leading to the tram cars ready for introduction into the cylinders for treatment. When in use along the right of way the operation is so planned that a car containing untreated ties is



The Air Control Valves Under the Cylinder Car

spotted at the adzing car and the ties are unloaded on to the conveyor. The empty car may then be shifted slightly ahead to the proper position for receiving the ties as they are discharged from the cylinder. As noted above, however, the track arrangement on the cars permits the varying of this cycle to meet different conditions.

In operating the plant it is not necessary to utilize all three cylinders. For convenience in describing the operation it will, however, be assumed that all three are to be used and reference will be made to the cylinders by the letters *A*, *B* and *C*. To start, a charge of ties is placed in any cylinder, which will be called *B*. Cylinder *C* is then filled with creosote by means of the pump, letting the air escape into *A*. The air from *A* is then let into *B*, while at the same time the charge of ties is being sprinkled with oil from the spraying apparatus, thus subjecting the

The Adzing Machine and Power Plant

ties to pressure and oil simultaneously. After the sprinkling, all of the air in *A* is pumped into *B*, treating the charge in *B* by pumping oil from the source of supply, raising the pressure in *B* to 450 lb., holding it approximately 30 min. During this operation cylinder *C* becomes ready to receive a charge of ties which is placed. Then in treating *B* air is forced into the charge in *C*, drawing a vacuum in *A*. That is to say, when running high pressure on a charge that has had air and oil a vacuum is drawn on a treated charge while running oil on the last charge in. The cars are handled by a line from the winch head on the gas engine.

This plant was built and is owned by the Railway Tie Treating Company of New York. It is operated by the railroad under the direction of the superintendent of the treating plant at Mt. Union, Pa.

The Importance of the Tie Renewal Problem

BY F. J. MEYER,
Roadmaster, New York, Ontario & Western, Walton, N. Y.

IMPORTANT AS THE problem of tie renewals has always been, it has never received the minute attention given rail replacement. Because timber has been plentiful and cheap, the present tie situation came on the railroad world without warning.

The entire problem of tie renewals has generally been left to the judgment of the individual section foreman with only limited restrictions by his superiors. The cost of the ties and of renewing them has not been thoroughly impressed on many trackmen. The everlasting question, "How many ties have you to put in?" has contributed largely to waste, for would not such questions, often followed by a word of commendation if the renewals were large, cause most any man to think in terms of numbers only? Also the unfortunate habit of cutting requisitions on general principles only leads foremen to order more ties than are actually required and if the cut is not as large as expected he puts the extra ties in to save his reputation. But there were many other causes which lead to waste in tie renewals. When the railroads, especially those built through timber land, were being constructed and during the time when wood was cheap and obtainable in the immediate neighborhood of a road, many ties of short life were used. This led to heavy and frequent renewals. Heavy renewals made rough track unless it was resurfaced out of face. Under such conditions a trackman was justified in building as permanently as his materials would permit.

As time passed and more durable ties were available, spot tie renewals became the accepted practice, although heavier renewals were, of course, made where ballast or rail operations were being carried on. With the advent of spot tie renewals rules covering the number of ties to be renewed in a mile, the method of inspection and the personnel of the inspectors were introduced. Probably each road worked out some plan consistent with its organization, its traffic and its earnings. From the vastly different opinions as to the best method of inspecting ties for renewal and the extent to which a tie should deteriorate before renewal it is quite evident that the whole question comes right back to the old problem of the individual making the inspection. If this is true, the man directly in charge of the track, the section foreman seems to be the man who should make the inspection. He is more familiar with the needs of his section than anyone else. As tie renewals should be consistent for the entire length of the roads, the inspection should be made under the personal direction of the roadmaster. Of course, where a roadmaster has a territory larger than he can properly cover he may have to delegate some capable assistant to work with the different foremen during the inspections.

The ties these men remove are what they have been taught should be removed. It seems that with the growing scarcity of timber, traffic requirements alone should govern the inspector and the tie under consideration should be compared with the quality of the available replacement. For instance, a road normally using a good grade of long leaf yellow pine has for this year's renewal a limited number of seasoned ties with an average life of ten years. It also has a number of very inferior ties with a possible life of five years. If normal renewals were made the road would use all the ties it has. By leaving in ties which should be taken out so far as their individual worth is concerned and by putting in ties only sufficient to keep the track structure as a whole safe, the inferior five year ties would not be used. That line should compare the tie being inspected with the inferior tie which may have to replace it, considering the comparative value of the two ties as they will stand a few years hence.

On the basis of traffic requirements, with the track structure as a whole considered and the comparison of the individual tie made with the most inferior possible replacement it seems that inspection for renewal should now be made. This basis would at least aid in giving tie production a chance to catch up, at least so seasoned wood could be used, even if all the ties could not be treated.

During the period through which we are passing and are about to pass each line and locality has its own problem to work out. There are, however, characteristics common to all lines. There are points where ties fail from mechanical wear rather than from decay. Where such conditions cannot be overcome by the use of heavier tie plates, the writer questions the advisability of using a treated tie, particularly if other points where ties fail only from decay have to be taken care of with untreated ties. There are probably many yards containing dead tracks where concrete ties can be used, at least at joints. There are other points where it seems that a permanent way could be built to advantage.

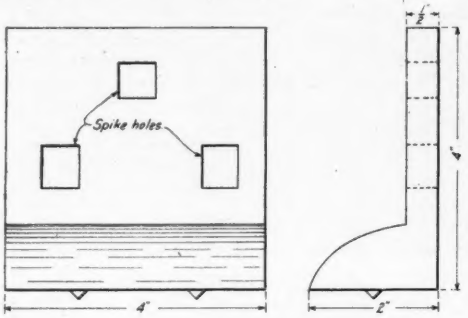
The tie shortage will probably continue. The available supply of tie timber in many localities is rapidly disappearing. The unnatural stimulation given tie production the past season in some sections has afforded temporary relief, but the fact that an abnormal number of ties is being cut in some sections only makes the future supply more uncertain and makes real conservation more necessary than ever. In addition, the increasing cost of making renewals emphasizes the need of greater conservation.

Without offering any suggestion for exchanging the various methods now used for inspecting ties for renewal, it is apparent that the question has become so big and so important that all the railroads, the various government agencies, the tie and timber manufacturers and the treating companies should co-operate in carrying on an intensive educational campaign in economical tie and timber maintenance. It is not a matter affecting the railroads only. It is a big national problem calling for the

utmost effort from the owner of the standing timber, and all the various agencies interested directly and indirectly right to the man who tamps the tie into place.

A NEW METHOD OF BRACING SHIMMED RAILS

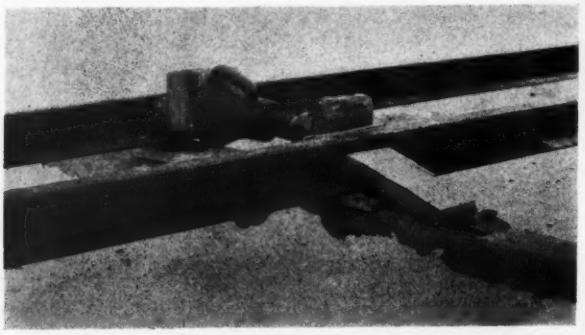
TRACK WHICH IS SHIMMED on account of heaving is subjected to increased danger of spreading on account of the decreased holding power of spikes with their diminished grip in the ties. On this account it is frequently necessary to brace the shimmed rails against overturning which is commonly accomplished by knee-



Approximate Outline of a Shim Brace

bracing shims against the outside of the rail, the shims being heeled against two spikes driven into the tie. Such braces are not highly efficient, the bearing area of the brace against the spikes is small and the holding power of the spikes is less than normal because they must have a grip on the end of the brace and are therefore not driven to full depth in the tie.

As a means of making these shim braces more effective D. McIntyre, roadmaster on the Canadian Pacific at Fort William, Ont., has devised a rail brace clip or heel of the form shown in the photograph and the drawing.



Method of Testing the Efficiency of the Shim Brace

It consists of a small plate of malleable iron or forged metal, provided with three holes for driving spikes into the tie and with a vertical bearing surface to receive the end of the brace, this surface being provided with two pointed projections which enter the end of the bracing stick to prevent it from slipping.

The effectiveness of a rail brace heeled with one of these clips instead of spikes driven in the ordinary fashion was tested by the inventor in the manner shown in the photograph. Two rails were placed side by side with just sufficient space between them to insert a small screw jack. The outer side of one rail was braced with a shim in the ordinary manner and the outside of the other rail was braced with a shim using one of the clips described above. The lateral wheel pressure on the rail was then simulated by screwing up the jack and it was found that the resistance of the brace supported by the clip was much more than that held by the spikes. These clips are now being tested under actual track conditions by a number of roadmasters in the vicinity of Fort William.

AN AUTOMATIC SWITCH LOCK

ONE OF THE most recent developments in track appliances is an automatic switch lock, in which the ordinary padlock is replaced by a fixed lock, forming an integral part of the lever latch housing. This device is known as the Deco automatic switch lock, and is being introduced by the Deeming-Endsley Company, Chicago, after extended tests in actual service. As shown in the photo of a ground throw stand, the side of the latch jaw supporting the latch which holds the lever in the closed position is provided with a lock arranged in such a way that the latch is locked automatically when the lever is thrown home. A keyway is provided to fit the standard switch key of the road on which it is used so that the switch is unlocked in the same manner as one fitted with the ordinary padlock. The lock jaws and base consist of a single casting, while the lock mechanism comprises only

Application of the Lock to Ground Throw and High Switch Stands

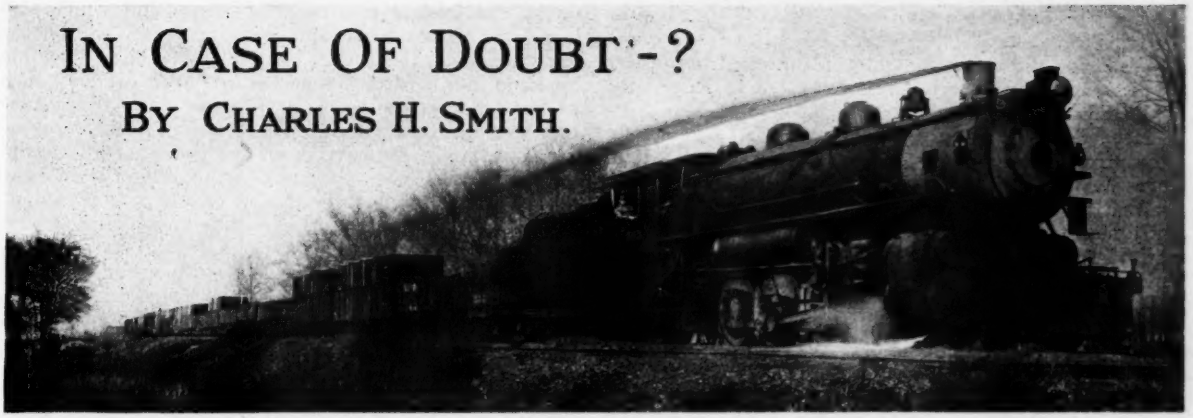
two pieces, the latch and a tumbler. The application of this lock to a high switch stand follows the same principles with such modification as is required to suit the operation of the high stand lever. In fact, the lock mechanism is even simpler for a high stand than for the ground-throw stand.

Ordinarily the lock mechanism would be applied only to lock the switch in the normal position, but for turnouts controlling routes of equal importance two locks could readily be applied. These locks can also be fitted with two or three keyways so that on joint tracks standard switch keys of all lines using such joint tracks will unlock the lock.

Aside from the advantage of automatic locking of the switch the manufacturers of this device call attention to the convenience of the fixed position of the lock which facilitates the operation of unlocking since the location of the keyhole is fixed. Furthermore, the possibility of losing the lock is eliminated and experience with snow and sleet shows that the device is not affected by adverse winter conditions to the same degree as the padlock.

IN CASE OF DOUBT-?

BY CHARLES H. SMITH.



IT IS SINGULAR, but none the less true, that momentous events often hingle upon trifles. It seems utterly incongruous that the fate of a nation should be decided up an eclipse of the moon—yet witness the fate of Athens. It seems absurd that the action of a half-crazed assassin should be the cause indirectly of plunging nearly the whole world into war. Yet we know it to be true. The pet superstition of many a great man has decided the policies of nations. In a like manner an apparently unimportant decision often decides the question of life or death for people of whom we have never heard.

It was early on one morning in late September that Big Bill Corrigan was called upon to make one of these apparently unimportant decisions. Corrigan, foreman of Section D-16, with his men had just pushed the motor car out of the car house and were about to commence the day's work. Because it was the latter part of September and the work on Section D-16 was pretty well caught up, Corrigan did not have any special task to do. His ties were in long ago, his right of way was mowed and his general surfacing was completed. Right now he was getting ready for the inspection special, which meant that he might put the finishing touches on any of a half dozen small jobs. Usually Corrigan planned his work a day or so ahead, but this time he had neglected to do so.

"Wait a minute, boys," he said, as the men pushed the motor car towards the main line track. "Let's see where we're going to work to-day. We might do a little more surfacing up at the west end, or we can build up the bank a little at Dead Man's curve, or we can clean up the yard at Hale. I guess that's what we'll do—clean up the yard at Hale and then go to the west end. Head the car east."

If you had told Corrigan that he was making a very important decision when he decided to go to Hale, the little flag station four miles east of Westvale, where his car house was located, he would have laughed at you and inquired as to the condition of your sanity. And yet you would have spoken the truth.

The men lifted the motor car upon the rails and then shoved it a few rods ahead until it was in front of the telegraph office. Corrigan stepped inside.

"Good morning, George," he greeted the operator. "We want to go to Hale. What's coming?"

"Good morning, Bill," replied the operator. "Wait a minute and I'll ask the dispatcher."

Taking the phone receiver from its hook he fitted it around his head and, cutting in, called the train dispatcher.

"Motor car going east. What have you got coming?" he asked when the dispatcher had answered him.

After receiving the reply he removed the receiver from his head and turned to Corrigan.

"The local, Extra 911 East, will be along in about an hour, and No. 2 is on time. That's all that is very close," he announced.

"All right," said Bill as he turned to go. "If we only had the automatic block signals installed through here we could keep pretty good track of the trains ourselves and not have to ask the dispatcher so much." Returning to his car, he boarded it and with his men sped away to the east towards Hale.

Hale is not an important station on the C. St. P. R. R. Two daily local passenger trains stop there when flagged and one local freight train does the small amount of switching and freight work there is to be done. No other trains are scheduled to stop there. Neither do trains meet at Hale. The only track besides the main line is a spur. The switch affording entrance to the spur is on the east end of it. It was in this yard that Bill Corrigan decided to work upon this particular morning in September, burning rubbish and putting the grounds in first-class shape.

Fifteen minutes after leaving Westvale, Corrigan and his men arrived at Hale, and, taking the car off the track at the set-off near the spur switch, they began working in the yard. Corrigan knew from experience that one of the things that the officers on the inspection train look at especially is the condition of the station yards. Therefore, he wished his territory to have a clean slate in this respect when the special went through in the early part of October. The job was a small one, and in about an hour the yard was looking spic and span, the scrap all piled up in an inconspicuous place, papers and other rubbish burned and all company materials picked up and in their places. Just as they were finishing the job the local freight, Extra 911 East, pulled in.

"Hello, Bill," said Scotty Lawson, the conductor, as he swung himself down from the engine cab. "Where's the agent?"

"Hello, Scotty," replied Corrigan. "He's around here somewheres."

At this moment the agent appeared in the depot doorway with some waybills in his hand.

"What have you got there?" asked the conductor suspiciously, as he noticed the waybills. "We can't monkey around here long. No. 2 is due in 20 minutes and it's going to make us do some tall hustling to make Reed City for them."

"I've got four empties to go," answered the agent. "And that's all. No load in."

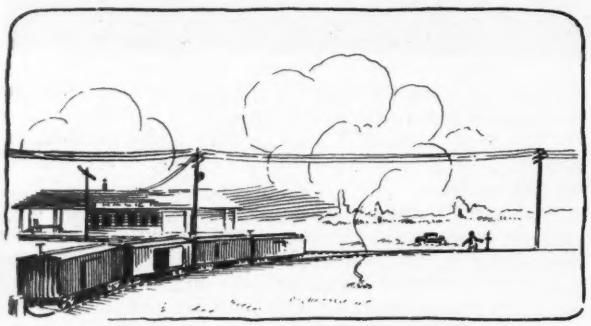
"That's right," growled the conductor. "Just because we're on short time you've got four empties to go. I

thought I brought those four cars for you to load hay in last trip?"

"Well, you did. But the shipper cancelled his order, so the car distributer has ordered them to Reed City for loading," explained the agent.

"Hey!" yelled Lawson to his brakemen. "Unload four pieces from the second car from the head end—four stoves. And hurry!" Then turning to the agent: "Say, ask that dispatcher how No. 2 is. See if we can get any time on them quick! We'll have to hurry like the devil if we make Reed City. We can't get into clear here."

The agent handed the waybills to the conductor and went into the office. In a minute he returned.



"In About an Hour the Yard Was Looking Spic and Span"

"No. 2 is right on time," he yelled to Lawson, who was helping the brakeman load the final heater into the freight house. "He won't give you a minute on them."

Various explosive words from the group of trainmen greeted this announcement as with accelerated movements they shoved the last stove through the door.

"We won't have time to put those four cars in the train," shouted the conductor to the engineer. "No. 2 is right on time. We'll take them behind the caboose. They only go over to Reed City, anyway. Pull up and back down on them and let's get out of town."

The engineer pulled the train by the spur switch and after Lawson had thrown the switch, backed down upon the four empties which occupied the spur. As soon as the brakeman saw that the coupling was made he gave a high-ball, the train started forward, cleared the switch and then slowed down while Conductor Lawson shut the switch and locked it. Sprinting after the rear car Lawson caught it, gave the engineer a high-ball, and, whistling off, Extra 911 East started up the three-mile grade to Reed City.

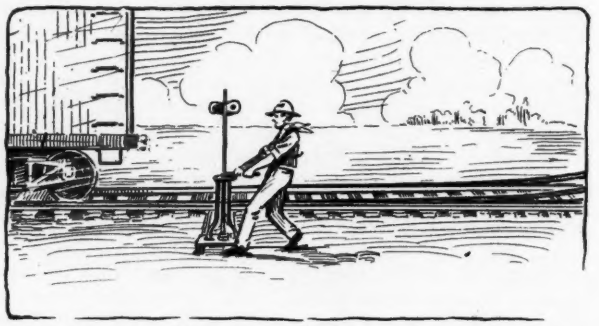
When the train cleared the spur Corrigan pulled out his watch and studied it a second. While the local had been working on the main line he could not, of course, move his car because the track was occupied. Now that they had gone he began to figure on getting to the west end of the section and finishing the surfacing job.

"No. 2 is due in ten minutes," he announced to his men. "We can't run very far in that time. They run pretty fast coming down from Westvale. I guess we better not try to go against them. We'll wait here until they pass."

They had been waiting scarcely ten minutes when, happening to glance up the track to the east, they were astonished to see four box cars shoot around the curve three-quarters of a mile away. For an instant they could scarcely believe their eyes, but the rapidly approaching cars left no doubt as to their reality. Almost instantly the explanation flashed into Corrigan's mind. The approaching cars were the four cars that had been picked up by the local a few minutes before and which had somehow broken loose and were traveling wild down the grade towards No. 2. What should he do? Jamming his hand into his trousers pocket he pulled out his bunch of keys and separating the switch key from the rest he unlocked the switch lock. To throw it meant wrecking the four cars. To leave it set for the main line meant that they might meet No. 2, the fast passenger train, head on. Twenty minutes ago No. 2 had been reported on time—still they might not be on time now. If they were not on time the cars could travel a half mile farther safely where they would strike a short steep grade and stop. These thoughts flashed through Corrigan's mind during the brief seconds it took him to unlock the switch and grasp the lever handle. The cars were only a score of rods off now and were coming swiftly towards him, swaying from side to side on their wild journey down the hill. Should he throw the switch and perhaps needlessly wreck the cars? Or should he allow them to follow the main line on the chance that No. 2 might have been delayed at Westvale? Quite often they lost from five to eight minutes loading express, mail and baggage there. Suddenly a vision of the cover of the time card flashed into his mind. On it his memory recalled the words printed in red ink across the top:

"In all cases of doubt or uncertainty, the safe course must be taken and no risks run."

In an instant he lifted the switch lever, threw his weight against it, opened the switch, latched the lever and leaped down the bank just as the first car struck the switch point. It careened over towards him at a dangerous angle—for a long second he thought its speed would derail it—then righting itself went plunging drunkenly down the spur track. The first car over safely, the other three followed, lurching madly from side to side, their speed scarcely checked, they sped swiftly to the end of



"He Lifted the Switch Lever and * * * Opened the Switch"

the spur, crashed over the bumping post and ran off the ends of the rails where they buried themselves in the earth, clear of the main line.

As soon as Corrigan saw the last car pass into the spur he jumped back up the bank to the switch stand and closed the switch. Scarcely had he done so when No. 2 appeared, less than a mile away. Giving them a glance, the foreman rushed to his motor car and grabbed the red flag. When he had brought No. 2 to a stop a vestibule opened and the conductor came out. The engineer also swung himself down heavily from the engine cab, oil can in hand.

"What's the matter? What's the matter?" demanded that portly individual testily. "What's all this here delay?"

"You're mighty lucky to be delayed if you only knew it," replied Big Bill. "See those four box cars piled up beyond that bumping post?" he continued, pointing to-

wards the cars. "You came so close to meeting them head-on about a half a mile west of here that it's not pleasant to think about. They got away from the local extra east someway and I had to ditch them to save your train."

"How did it happen?" asked the conductor.

"Don't know. The local east pulled out of here taking them from the spur less than 20 minutes ago. They picked them up behind their caboose on account of being on short time. I happened to be working here in the yard and when I saw them shoot around the curve coming down the hill I knew that they had broken loose and were running towards your train. So I threw the switch and caught them in the nick of time."

"You certainly were Johnny-on-the-spot," said the conductor. "That's what I call good head work."

"You prevented a wreck all right," agreed the engineer. "I'm sure thankful to you for keeping my skin whole, Pal."

"The reason I flagged you," continued Corrigan, disregarding their praise, "was because that Extra 911 may be down here after those cars. They, of course, will not be able to figure out how you can get by the cars, as they knew you were on time, and on the slim chance of catching them they might come down without flagging ahead —you never can tell in an emergency like this. If they thought they could catch the cars they might try to do so to save your train. So I flagged you. Safety first, you know."

"You're right there, Pard," agreed the engineer. "You are all right."

The conductor nodded his agreement. "It was the proper thing to do without a doubt," he said. "Now we'll back up to the telegraph office and see if we can find out where the 911 is at."

In the little depot the sounders and telephone had been calling frantically. When the conductor and Corrigan stepped inside the agent was busy copying an order.

"Pretty good work, Bill," he said, when he had finished the order and, looking up, saw the two. "You sure scratched up those four box cars some, but you saved a trainload of people." Turning to the conductor, he handed him the order which informed him that Extra 911 was in the clear at Reed City and the track ahead clear.

"How did those cars get away from that local?" asked the conductor.

"When the 911 stopped at the switch to head in at Reed City the knuckle lock on the car next to the caboose broke and they uncoupled," explained the agent. "Lawson picked them up there in such a hurry that he never saw that the air was cut through on them and so when they broke loose there was nothing to stop them from running down the hill. The rear brakeman tried to catch them, but he couldn't run fast enough after he noticed them going. And I guess you know the rest. If Corrigan hadn't been right on the job—well, you can guess what the result would have been as well as I can."

"Not a doubt about it," added the conductor. "Corrigan saved us a very bad smashup. Is it all right to go ahead now?"

"Yes—the dispatcher says O. K. to go now," answered the agent.

At this juncture a very large individual, a passenger on No. 2, came up to the conductor, scowling darkly. His manner was distinctly belligerent.

"Conductor, how much longer is this train going to be delayed here while you chat with the section boss and the station agent? I paid my fare to get to Kansas City by four o'clock and I want to get there. All this delay is unnecessary. We're twenty minutes late now. If you don't get out of here quick I'll report the whole of you to the federal manager."

For a moment the con's eyes twinkled humorously, then he gave a sly wink at Corrigan and the agent.

"Beg pardon, sir," he said gravely, turning to the large important individual. "Now that you remind me of it, I see that we are a trifle late. Let's go."

The pompous individual boarded his Pullman, the conductor, after delivering a copy of the order to the engineer, swung himself into the open vestibule and No. 2 proceeded on its way.

ENGINEERS' SALARIES ADJUSTED

A DEFINITE classification of the lower technical positions and adjustment of salaries has been authorized in the Northwestern Region by R. H. Aishton, regional director, in a communication to the federal managers in this region for their information and guidance. The statement covers positions in the engineering, mechanical, land and valuation departments below the grades of assistant engineer and chief draftsman, and the definition of each grade includes a salary rating giving the maximum and minimum limits of salary comparable to the character of services rendered in each grade of position. This classification was prepared by a committee consisting of H. E. Stevens, chief engineer of the Northern Pacific, C. F. Loweth, chief engineer of the Chicago, Milwaukee & St. Paul, and A. Montzheimer, chief engineer on the Elgin, Joliet & Eastern, and is the result of a detailed study of the technical service of the roads in this region. The classification is given in detail below:

SCHEDULE

DRAFTSMEN, CLASS 1, $200-225

On general or special duty, requiring special knowledge, training and experience, and a special degree of initiative and originality, thoroughly competent, engaged regularly in the design and general direction of the design of large and difficult work on yards and terminals, track details, etc., or steel, concrete and timber bridges and structures, or special buildings, etc., or locomotives, cars, special machinery, mechanical and electrical power plants, etc.

DRAFTSMEN, CLASS 2, $175-190

On general or special duty, requiring special knowledge or training and experience and the use of initiative and originality. Engaged in the general designing and the direction of detailing of plans of yards and terminals, track details, etc., or steel, concrete, or timber bridges and structures, or special buildings, power plants, etc., or locomotives, cars, special machinery, or signals and signal apparatus, or land, right-of-way and valuation maps and profiles from field notes and records.

DRAFTSMEN, CLASS 3, $150-165

On general or subordinate duty, requiring special knowledge or training, experience and initiative, generally engaged in the designing and detailing of work in accordance with standard practices, and the direction of work of a minor character on right-of-way maps, mileage records, or steel, concrete and timber bridges and structures, or locomotives, cars, special machinery, mechanical and electrical power plants, or signals and signal apparatus, or land, right-of-way and valuation maps and profiles from field notes and records.

DRAFTSMEN, CLASS 4, $125-140

On subordinate duty requiring a certain amount of knowledge, training and experience and engaged generally in detailing, compiling and recording general engineering plans, land and right-of-way maps, or valuation maps and profiles, or records of bridges, buildings, locomotives, cars or signals.

TRACERS, $100-120

On subordinate duty requiring a certain amount of experience or knowledge of drafting. Capable of doing neat, accurate and rapid work.

ENGINEERING INSPECTORS, CLASS 1, $175-185

On general or special duty requiring special knowledge, training and experience and the use of initiative. Capable of directing and supervising the inspection of extensive engineering construction and all classes of construction materials.

ENGINEERING INSPECTORS, CLASS 2, $150-165

On general duty requiring special knowledge or training and experience and the use of initiative. Capable of supervising the inspection of average engineering construction and materials.

ENGINEERING INSPECTORS, CLASS 3, $125-140

On subordinate duty requiring a certain amount of knowledge or training and experience. Capable of inspecting minor construction work and materials.

INSTRUMENTMEN, CLASS 1, $180-200

On general or special duty, requiring special knowledge, training and experience and the use of initiative. Capable of directing a field party, and responsible for technical field work of a complicated and difficult nature, and platting the field notes and data.

INSTRUMENTMEN, CLASS 2, $150-170

On general or special duty, requiring special knowledge, training and experience and the use of initiative. Capable of directing a field party, making personal investigation of ordinary field work, and platting the field notes and data.

RODMEN, CLASS 1, $120-130

On subordinate duty with knowledge, training and experience. Capable of doing ordinary field work without supervision or more difficult field work with supervision, and platting the field notes and data.

RODMEN, CLASS 2, $100-115

On subordinate duty with a certain amount of knowledge of field work, but not required to use transit or level.

CHAINMEN OR TAPEMEN, $90-100

On subordinate duty, preferably with a certain amount of knowledge or experience in field work.

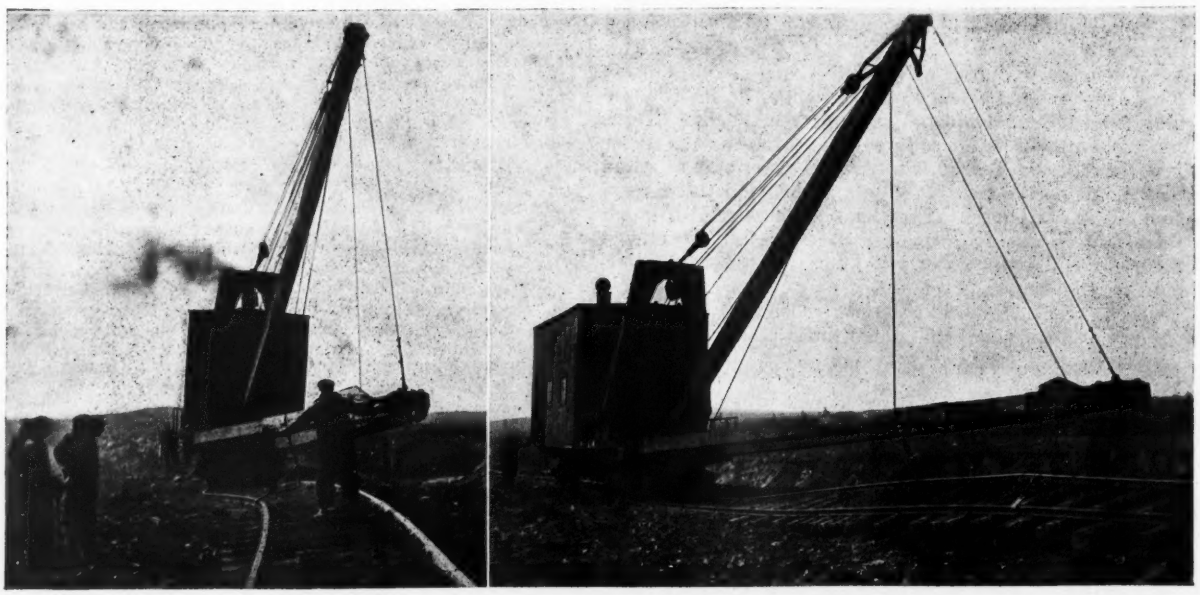
A DERRICK FOR SHIFTING TRACK

THE TRACKS on spoil banks of the Oliver Iron Mining Company in Minnesota are being shifted by four special design derrick cars at a very marked reduction in time and cost as compared to throwing them over with a gang using lining bars and it is thought that the methods used there may be applicable in yard construction or other work where extensive bank widening is being done. The equipment consists of a flat car carrying a three-drum steam hoisting engine with an auxiliary drum for a boom swing line. At the forward end of the car is a steel and timber A-frame and a timber boom following ordinary light service (10-ton capacity) construction standards. The special equipment consists of a horizontal A-frame formed of two timber sticks with steel connections designed to extend forward horizontally from the end of the car. The two sticks are held together at their outer ends by connection plates with holes so placed that the vertex of the A-frame is offset to either the right or the left of the center line of the car by a distance of 10 ft. 2 in., depending on how the connection is bolted up. In other words, the end of the A-frame affords an anchorage 10 ft. 2 in. to either the right or the left of the track toward which it may be hauled.

In operating the car the track is first lifted by a line from the boom with the aid of a grab hook attached to the rail on the side toward which it is to be shifted so as to pull the ends of the ties out of the dirt or so that the ties will be inclined on an angle of about 15 deg. Then a second line from the end of the horizontal A-frame is attached by a hook to the far rail and as this line is hauled in the track is shifted over bodily.

It is not necessary to detach splice bars or to take spikes out. In practice it has been found that there is sufficient flexibility in both rails and ties to permit of a track being thrown bodily to one side a distance of 8 ft. Having performed this operation, the machine moves backward 20 ft. or so under its own power and goes through the same operation again to move the next section of track. No trouble has been experienced with the breaking of rails, as it is found that they will bend sufficiently to accommodate themselves to the S curves that the machine throws in the tracks at each successive operation.

We are indebted for the above information to S. S. Rumsey, chief engineer of the Oliver Iron Mining Company, and W. A. Clark, chief engineer of the Duluth, Missabe & Northern of Duluth, Minn. These cars were built by the Clyde Iron Works, Duluth, Minn.

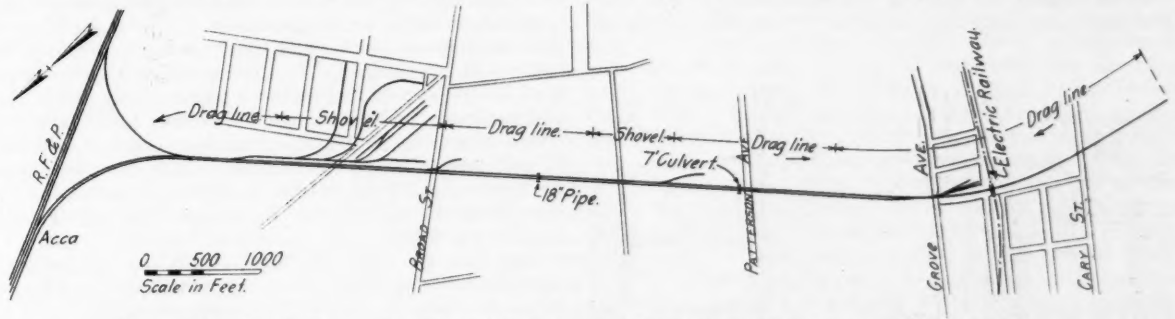


Two Steps in the Throwing of a Section of Track

TRACK DEPRESSION LEADS TO DIFFICULTIES

Grade Separation on the R. F. & P. at Richmond, Va., Involved Correction of Soft Roadbed Conditions

WORKING TO A sub-grade ranging from 8 to 10 ft. below the beds of intersecting and adjacent water courses and ponds, the Richmond, Fredericksburg & Potomac recently completed a revision of grades approximately two miles in extent on its James River branch in Richmond, Va. The work involved the construction of a double-track roadbed at an elevation approximately 18 ft. below the grade of the old line at the point of the maximum change with a minor revision of line to center the new work on the right-of-way. It involved 425,000 cu. yd. of excavation, a considerable portion of which was quicksand, and an elaborate drainage system, including more than three miles of concrete sewer. Many difficulties arising from water conditoins were encountered in making the excavation and the soft bottom and flowing banks complicated the construction of the sewer and the new roadbed.



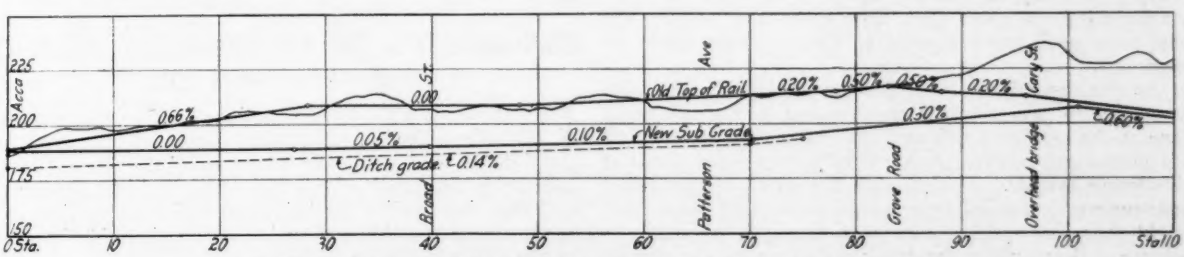
Map of the Track Depression District Between the B. R. & P. Main Line and Cary Street

The James River branch departs from the main line of the Richmond, Fredericksburg & Potomac at Acca, Va., and extends south to the James river, connecting there with a branch of the Atlantic Coast Line, the two branches forming the so-called belt line around Richmond, which was built originally in 1890 to provide a means of detouring freight around the city. On the completion in January of this year of the new passenger terminal facilities at Richmond, used jointly by the Atlantic Coast Line and the Richmond, Fredericksburg & Potomac, the old passenger line through the city was abandoned and this belt line now carries both freight and passenger traffic.

At the time of its construction the belt line was located entirely outside the city. Within recent years, however, the city limits have been extended and now include that portion of the James River branch affected by the improvement. Within the limits of the present work the unimproved line was crossed overhead by Broad street, Cary street and the tracks of the Virginia Railway & Power Company, while Grove and Patterson avenues crossed the track at grade.

Recent sub-division plans provide for the extension across the track of 13 additional streets. This, combined with the greatly increased traffic, made it advisable to develop plans for the separation of grades and, after negotiation with the engineering department of the city of Richmond, a track depression scheme was adopted which provided for the streets to be extended across the tracks at approximately the elevation of the natural surface of the ground. This made possible a greatly improved track gradient.

Under the old conditions the branch was double tracked from Acca to Grove avenue, a distance of approximately 1½ miles, and was single track from Grove avenue to the James River bridge. In the double track section the center line of the southbound track was on the center line of the right-of-way, a condition which was taken advantage of in the construction of the new roadbed. Leaving Acca yard over the old line, ascending grades of 0.66 per cent were encountered with a short section of 0.8 per cent for 3,500 ft., then approximately level for 3,000 ft., followed by a 0.2 per cent grade to the summit near Cary street. From the summit the grade to the James River bridge was all descending.



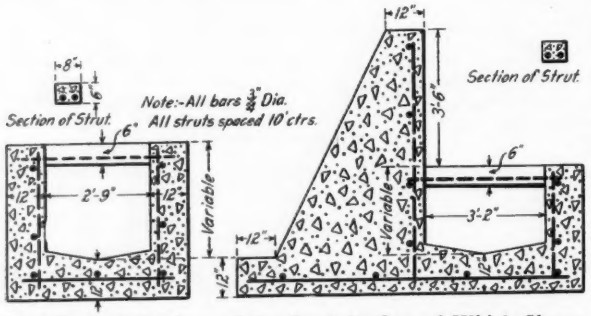
Profile of New and Old Lines from Acca to End of Grade Separation

The new grade line contains ascending grades of 0.05 per cent for 2,700 ft. leaving Acca yard, then 0.1 per cent for 3,000 ft. and 0.5 per cent for 3,100 ft. to an intersection with the old grade. The establishment of these grades necessitated the construction of the new roadbed below the beds of intersecting streams and the development of an elaborate drainage system.

Making the excavation for the new roadbed involved the moving of 425,000 cu. yd. of material. The quipment used included three dragline excavators, one steam shovel and six pumps for raising the water out of the cut and discharging it into natural courses on the higher level. The material moved was spread beyond the top of slopes to elevations fixed by the city. The new roadbed is centered on the right-of-way, and to take advantage of the off-center location of the old line, the first cut was made on the southbound side.

Three dragline excavators were used in making this first cut, one starting at Acca yard, a second one just south of Broad street and the third at Patterson avenue. All the machines worked in the same direction, south, for by this arrangement the drainage was always away from the work. It also permitted the use of the existing bridge at Broad street until it was convenient to build a temporary wooden structure to the south of the old bridge.

To the north of Broad street the excavation proceeded without trouble, there being no obstacle to interfere with drainage away from the machine. To the south of Broad



Two Typical Sections of the Conduit, One of Which Shows Combination of Conduit and Retaining Wall

street the water had to be lifted out of the cut by means of pumps installed at Broad street and Patterson avenue. In this territory quicksand was also encountered which, with the poor drainage, resulted in flowing banks. South of Patterson avenue one of the machines worked 24 hours continuously without making a move, the bank flowing into the cut as fast as the material was taken out. In this stretch the flow of the banks was sufficient to endanger the high line and grading operations were discontinued for a short time, then continued, leaving the cut high until the obstacles to the drainage could be removed.

As the second cut could not be made with the high level line in operation the construction of a single track line at the low level followed the making of the first cut as closely as possible. Again trouble was experienced at Patterson avenue. At this point the strata of quicksand encountered extended approximately six feet below and eight feet above sub-grade. An attempt was made to secure a bearing for the track structure by the use of cinders overlaid by washed gravel ballast. This did not prove to be feasible and the cinders and gravel were taken out to sub-grade and a mattress made of 3-in. plank 16 ft. long was placed under the track. The planks in the bottom course were placed laterally and supported the longitudinal members, the mattress then being covered with two feet of cinders. When the load was applied the soft material in the bottom was forced out into the side ditches and up through the mattress. This plan was then abandoned and two rows of piles were driven on the line of the rails and capped with longitudinal stringers over which the ties were framed. This plan proved successful and the trestle was filled to the ballast level and is still carrying the traffic on this track. After the installation of the drainage system the cut dried out rapidly and the condition became more nearly normal.

The methods followed in making the second cut were similar to those followed in the first except for the use of a steam shovel in addition to the three draglines. The material moved by the shovel was also placed beyond the top of the slopes, being moved to place in narrow-gage equipment.

The drainage system installed in the cut comprised more than three miles of concrete sewers, requiring the use of 400,000 lb. of reinforcing steel. The typical sections of the sewer which are shown indicate the different forms of construction. The wall section was built in the territory where the bottom and banks were particularly soft. South of Patterson avenue on the west side of the cut a section of this type was floated on the quicksand and after traffic was put on the single low level track, the sand flowed out from under the wall owing to the weight of trains, causing the wall to tilt about 2 in. out of perpendicular, the list being against the thrust and indicating that the bottom of the wall was moving in towards the track with the shifting foundation. Cracks also developed in this section and the wall shifted badly out of line, making it advisable to rebuild the section. North of Patterson avenue a slide in the cut slope cracked a section of wall about 75 ft. long and caused it to move in toward the track about 8 in. After traffic was put on the low level track the mud flowed from under the wall, causing further movement. This section will also be rebuilt.

The concrete plant for the construction of the sewer was located at the high level. It consisted of a mixer of 17 cu. ft. capacity and a 24-in. gage track, laid just beyond the top of the slope. A dinkey engine transported the concrete in buckets of 34 cu. ft. capacity mounted on trucks. All of the concrete was placed in the forms by means of chutes.

Work on this project was begun in September, 1916, and the new double track line was opened to traffic in January of this year. The improvement was made under the direction of S. B. Rice, engineer of maintenance of way of the Richmond, Fredericksburg & Potomac, and E. M. Hastings, resident engineer, who was in direct charge of the work. Winston & Co. of Richmond, Va., was the contractor. H. Frazier, consulting engineer, had charge of the negotiations with the city and the adoption of a plan.

DURABILITY OF UNTREATED PILING ABOVE LOW TIDE

IN TIDAL WATERS the portions of piles above mean low tide, although completely immersed only part of the time, may be practically saturated all the time. Wood constantly saturated with water is not subject to decay, and this fact makes the height to which saturation extends above low tide a question of considerable interest to the designing engineer.

The opinion of a number of engineers and construction companies, expressed in response to inquiries by the Forest Products Laboratory at Madison, Wis., is that untreated piling in water not infested with marine woodborers will remain sound indefinitely if cut off at half tide. This height ranges in various ports from 2.3 to 4.5 ft. above low water. At certain places on the Atlantic coast, piles cut off at the height of half tide are still sound after from 50 to 100 years of service.

Untreated piling is destroyed by marine borers more rapidly than by decay, and the information given would, of course, have no practical use where these organisms are active.

ACTIVITIES OF THE RAILROAD ADMINISTRATION

No Marked Changes Expected in Railroad Legislation

Wage Demands and Plumb Plan Subjects of Hearings

Washington, D. C.

PROSPECTS FOR effective railroad legislation before the date set for the return of the railroads to their owners, January 1, are still in an indefinite shape. While railroad men have been greatly encouraged during the past few months by the many manifestations of a more sympathetic attitude toward them and a better understanding of some of the difficulties of their situation on the part of Congress, the fact remains that Congress is a large and unwieldy body, just at present somewhat lacking in leadership, and composed of two houses that frequently arrive at very different conclusions, and many close observers are beginning to fear that the multitude of conflicting plans and theories for the future handling of the railroad problem may result in a confusion from which only a minimum of action will result. The House committee on Interstate and Foreign Commerce has been holding daily hearings since July 15, at which it has been listening to the advocates of various plans, some of which had previously been presented to the Senate committee earlier in the year, but has devoted a large part of its time to the Esch-Pomerene bill, which does not represent any new "plan" or change of policy as to railroad regulation, but which is designed rather to round out and increase the powers of the Interstate Commerce Commission by amendment of the act to regulate commerce, with some removal of the former restrictions upon the railroads subject to the commission's consent and approval. This bill seems to be favored by shippers and has met with little criticism except on the ground that it is too conservative and leaves too much to the discretion of the commission, whose views it represents, but it is rapidly becoming apparent that it will be reported by the committee as the House bill. There will be some amendments, but probably little or no recognition of any of the more fundamental changes in the policy of railroad regulation that have been urged by the railway executives, the security owners and the business men of the country, as represented by the United States Chamber of Commerce and as distinguished from those who allow themselves to be represented by their traffic managers.

The Senate committee, on the other hand, after listening to various plans in the spring, has not been holding public hearings, but has appointed a subcommittee to draft a bill which will form the basis of its report to the Senate. This subcommittee has been in consultation with Director General Hines and various other authorities and as this is written is about to come forth with a bill representing a more radical and fundamental change in the governmental policy of regulation. The Senate will ultimately engage in a protracted debate based on the recommendations of its committee and the House in a less protracted discussion of its bill which will probably result in two entirely different bills being passed and sent to a conference committee. To get legislation it will then be necessary for both houses to reach an agreement on some compromise proposed by the conferees as to which prediction at this time would be futile, although the Senate bill will naturally carry more weight, but the guess that comes nearest to a minimum of change appears likely to stand the best chance of being correct.

An outline of the principles which the carriers believe should be incorporated in legislation for the return of the roads was presented on August 19 by Thomas De Witt Cuyler, chairman of the Association of Railway Executives. The fundamental proposal is that the public authorities shall approve rates that will enable the railroads of the country to be self-sustaining and to command the new capital needed for the expansion of railroad facilities with the growth of population and industry, but with no guarantee of income by the government. The railroads propose a definite instruction by Congress to the commission that rates shall be adequate and they also propose a Federal Transportation Board, charged with the general oversight, from the point of view of the public interest, of all transportation, to be co-ordinate with the Interstate Commerce Commission and to relieve it of all functions except rate regulation, valuation and accounting. Pending a readjustment of rates, to be worked out by the commission, the new board and the director general, they propose that the present government guarantee of the standard return be continued.

The Plumb Plan

What has been regarded by many observers as an attempt on the part of the organized railroad employees to "throw a monkey wrench into the machinery," with the purpose of preventing the return of the railroads to their owners, has recently attracted much attention, both in Washington and throughout the country. Following immediately upon the presentation of demands for increased wages, accompanied by threats of strikes if they are not acted upon promptly, and by an actual, though officially unauthorized, strike of the shop employees, the Plumb plan bill was introduced in Congress and various thinly veiled threats were made by the labor leaders, who testified at the hearing on it, that unless something like it were adopted a "revolution" would ensue and that organized labor would bend its efforts to elect new Congressmen who would support it. When the members of Congress plainly indicated their resentment of the threats and their complete opposition to the plan the labor leaders adopted a less belligerent attitude, but the Plumb press bureau has been very active in circulating charges involving most of the financial history of the railroads, upon which it demands a Congressional investigation before the railroads are returned to the "unclean hands" of their owners.

New Wage Demands

The Railroad Administration is again faced with a general demand from the labor organizations for in-

creased wages. The new cycle was started early in the year by the shop employees, who were given a hearing before the Board of Wages and Working Conditions during the spring. About the time the wage board gave to Director General Hines a divided report, the labor representatives recommending part of the increase asked and the management representatives recommending no increase at this time, various other organizations began to file their demands. Some of them said they would prefer a reduction in the cost of living, which has had the effect of inducing a very busy governmental drive against alleged "profiteering," but they also indicated they did not intend to wait very long for it, and many of them are strengthening the hands of their leaders by taking strike votes even before the demands are considered. Director General Hines and the President at first inclined to act without consulting Congress and recommended the creation of a special wage commission, but when Congress declined to accept the responsibility the President directed Mr. Hines to take the demands under consideration on their merits. Formal demands for new and increased wage scales have been filed in addition to those of the shop employees by the trainmen and the conductors included in the Brotherhood of Railroad Trainmen, yardmen, firemen and hostlers, maintenance of way employees, and the clerks, and others have served a general notice of their intention to ask higher wages. It has been estimated that to grant general increases on the basis of the advance of approximately 25 per cent recommended by the labor members of the wage board would cost between $600,000,000 and $800,000,000 a year, and some of the demands represent in increases of 50 per cent and over.

MAINTENANCE EMPLOYEES ASK INCREASED WAGES

The United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers, which during the past year has taken in a large number of the maintenance of way employees as well as many employees usually classified as "miscellaneous," on August 11 submitted to Director General Hines a demand for large increases in wages, retroactive to January 1, 1919. The request has not yet been given consideration, but undoubtedly will be in connection with the demands presented or about to be presented by other organizations. The maintenance of way employees also have pending a demand for a national agreement as to uniform rules and working conditions, on which a recommendation was made to the director general some time ago by the Board of Wages and Working Conditions, but which he has not yet passed upon, although a conference on its was held recently with a committee representing the employees. As the director general has promised to enter into a similar agreement with the shop employees it is reasonable to suppose that he will follow the same course with the maintenance employees, although there may be some further negotiations as to the details. While technically binding only during the period of federal control, such an agreement would probably be very difficult for a railroad to get rid of after the return to private management.

The new scale of wages proposed by the brotherhood, which is affiliated with the American Federation of Labor, includes some rather extravagant figures, much larger than those demanded by the same organization earlier in the year. A new proposed wage scale was appended to the demand for uniform rules and working conditions, but the organization was informed that wage increases would not be considered at that time. The scale submitted to Director General Hines covers several classes of employees who are represented by other organizations, including the bridge and building, track, shop and signal departments. The proposed rates for foremen range from $200 up to $270 a month. The higher rate is asked for general bridge and building foremen, $250 for bridge and building carpenter foremen, $250 for general foremen and switch foremen, $240 for extra gang and work train foremen, and $208 for section and relief foremen. Some of the other rates asked are: Regular trackmen, 65 cents an hour; trackwalkers and inspectors, 65 cents; track apprentices and assistant section foremen, 67 cents; bridge and building carpenters, masons, bricklayers, etc., 67 cents; powder men, 90 cents; stationary firemen, 67 cents; pile driver, derrick, hoisting and steam crane engineers, 90 cents; crossing flagmen, 60 cents; train watchers and lamp tenders, 60 cents, and camp car cooks, 62 cents. In the signal department the proposed rates are: Signal construction foremen, $260 a month; assistant construction foreman, $1.15 per hour; signal maintenance foreman, $260 a month; assistant maintenance foremen, $1.15 per hour. Time and one-half for overtime is also asked and a referendum vote is being taken, giving the officers of the organization power to call a strike if necessary.

MAINTENANCE OF WAY EXPENDITURES

Expenditures for maintenance of way and structures of the Class I railroads for the first half of 1919 were $370,823,325, as compared with $288,500,683 in the corresponding period of 1918, an increase of 28.5 per cent. For the first five months of the year the increase was 38 per cent, indicating that the six months figures for this year were affected by the order to hold down maintenance expenditures during June. The average for the first six months of the test years 1915, 1916 and 1917 was $200,136,000, compared with which the 1919 figures show an increase of 85 per cent. For the month of June, 1919, the maintenance of way and structures expenses were $66,271,891, as compared with $67,875,290, in June, 1918, a decrease of 2.4 per cent, but the comparison is impaired by the inclusion of large amounts of back pay in the figures for last June. For the previous months of this year the maintenance of way expenses have been as follows: January, $58,274,720; February, $54,101,638; March, $59,478,891; April, $63,395,089, and May, $68,898,116. The six months' maintenance expenses this year represent 17.7 per cent of the total operating expenses as compared with a ratio of 17.1 in the test period.

The maintenance of way department of the Railroad Administration is engaged in a careful study of the maintenance of way expenditures of the various roads and the budgets submitted in accordance with the instructions issued by W. T. Tyler, director of the Division of Operation, which were outlined in last month's issue. The expenditures are being compared with the equation factor for each road which represents the expenditures for the test period with allowance for increased wages and material prices and directions are issued to fit individual cases, taking into consideration special conditions, in an effort to comply with the government's contract obligations, but to prevent any expenditure in excess of that amount.

The following tabulation of expenditures for June, 1919, for maintenance of way and structures on roads having operating revenues above $25,000,000 for 1918, is of particular interest in view of the instructions which were issued for the curtailment of expenditures early in that month. From this tabulation, which includes roads reporting about 80 per cent of the total operating revenues of all roads having annual operating revenues above $1,000,000, it will be noted that the total expenses for maintenance of way and structures show a decrease of approximately $1,500,000, as compared with the same month of the previous year, although the figures for

June, 1918, include back pay for June to May, 1918, on account of wage increase granted in General Order 27.

MAINTENANCE EXPENDITURES

Name of Road		1919	1918
EASTERN DISTRICT			
B. & O.	June	$ 1,998,361	$ 2,394,590
	6 months	12,763,303	10,057,948
B. & M.	June	948,491	1,045,781
	6 months	4,563,059	4,083,863
C. R. R. of N. J.	June	332,939	376,803
	6 months	2,432,973	1,663,761
C. & E. I.	June	309,164	357,963
	6 months	1,818,135	1,502,221
C. C. C. & St. L.	June	602,985	812,649
	6 months	4,329,452	3,237,901
D. & H.	June	231,415	294,700
	6 months	2,049,311	1,796,533
D. L. & W.	June	717,727	517,042
	6 months	3,211,841	2,134,595
Erie	June	1,102,380	1,224,878
	6 months	5,024,814	5,049,862
L. V.	June	998,453	767,607
	6 months	4,288,496	3,060,488
M. C.	June	821,250	810,651
	6 months	4,985,624	3,567,086
N. Y. C.	June	3,314,483	3,954,318
	6 months	19,173,541	15,515,630
N. Y. N. H. & H.	June	1,292,203	1,441,046
	6 months	6,685,207	5,652,231
Pa. West. Lines	June	1,146,197	1,307,620
	6 months	6,693,195	6,455,779
P. R. R.	June	6,224,164	4,803,135
	6 months	25,784,976	21,664,358
P. M.	June	268,647	408,533
	6 months	2,080,908	1,776,180
P. & R.	June	559,043	887,923
	6 months	3,615,185	3,313,047
P. & L. E.	June	375,370	411,711
	6 months	2,890,376	2,060,202
P. C. C. & St. L.	June	1,082,811	1,080,375
	6 months	5,581,552	5,057,324
Wabash	June	690,030	648,000
	6 months	3,371,550	2,537,205
Total Eastern District	June	$ 23,016,113	$ 23,545,325
	6 months	121,343,498	100,186,214
SOUTHEASTERN DISTRICT			
A. C. L.	June	748,603	682,108
	6 months	4,672,983	2,902,961
C. & O.	June	1,167,430	1,081,368
	6 months	5,531,386	4,024,105
I. C.	June	1,334,156	1,790,055
	6 months	8,827,800	7,708,738
L. & N.	June	1,158,242	1,278,968
	6 months	8,015,845	5,388,147
N. & W.	June	699,389	1,152,141
	6 months	4,804,049	4,403,436
S. A. L.	June	380,985	495,190
	6 months	2,956,803	1,954,304
Southern	June	1,874,291	1,602,418
	6 months	10,592,328	6,135,425
Total, Southern District	June	$ 7,333,094	$ 8,082,248
	6 months	45,401,193	32,517,116
WESTERN DISTRICT			
A. T. & S. F.	June	$ 1,824,003	$ 2,205,690
	6 months	11,604,405	9,601,027
C. & N. W.	June	2,032,587	2,004,685
	6 months	9,692,877	8,546,263
C. B. & Q.	June	2,038,224	2,322,912
	6 months	10,735,258	9,252,013
C. M. & St. P.	June	2,536,926	1,949,462
	6 months	9,903,846	7,567,820
C. R. I. & P.	June	901,804	1,516,604
	6 months	7,996,568	6,171,085
D. & R. G.	June	496,089	432,543
	6 months	2,211,193	1,636,732
G. N.	June	1,607,487	1,832,925
	6 months	9,539,390	8,179,578
M. St. P. & S. S. M.	June	601,488	694,432
	6 months	2,931,271	2,478,590
M. K. & T.	June	495,042	772,067
	6 months	3,090,325	2,443,738
M. P.	June	1,313,071	1,675,395
	6 months	8,457,194	6,535,559
N. P.	June	1,817,695	1,783,709
	6 months	8,484,290	6,940,702
O. S. L.	June	731,166	475,230
	6 months	3,713,376	2,204,183
O. W. R. & N.	June	415,580	368,898
	6 months	2,633,764	1,858,690
St. L.-S. F.	June	918,713	1,124,181
	6 months	5,797,266	4,730,565
S. P.	June	2,218,313	1,489,496
	6 months	13,931,387	8,936,975
T. & P.	June	296,320	391,603
	6 months	2,452,434	1,595,330
U. P.	June	1,172,218	961,210
	6 months	7,589,890	4,709,928
Total, Western District	June	$ 21,416,726	$ 22,001,042
	6 months	120,744,734	93,398,778
Grand Total, All Districts	June	$ 51,765,933	$ 53,628,615
	6 months	287,489,425	226,102,108

$289,000,000 DEFICIT FOR SIX MONTHS

Complete figures issued by the Railroad Administration covering the operation of the Class I railroads for June and the first half of the calendar year show a deficit of $289,280,538, as compared with one-half of the guaranteed standard return for a year. Operating revenues were $2,324,499,304, an increase of 13.1 per cent, and operating expenses were $2,056,720,484, an increase of 14.9 per cent. The net operating income was $156,827,416, whereas six-twelfths of the standard return is $446,107,954. The ton-mileage of revenue and non-revenue freight handled during this period was 15.2 per cent less than for the first six months of 1918. The income of the roads for the half year represents 39.8 per cent of the net operating income for the test period in which the standard return is based. A total of 58 of the Class I roads failed to earn operating expenses and taxes and only 20 earned their standard return, most of these being small roads that are handling a greatly increased traffic. For the month of June 45 roads had deficits and 33 earned the standard return.

RAIL BIDS SUBMITTED

Bids were received by the Railroad Administration on August 16 from several steel companies on its inquiry for prices based on 100,000 tons of Bessemer and open-hearth rail. In the absence from Washington of H. B. Spencer, director of the Division of Purchases, decision as to the quantity to be ordered was postponed but Director General Hines expected to take up the matter with him in a few days. It was understood that more than 100,000 tons might be ordered if the prices were satisfactory and it has been reported that the proposals were at the same prices as were quoted on the order placed earlier in the year, $55 and $57.

In view of the early termination of federal control supplement No. 2 to General Order No. 12 has been issued by the Railroad Administration to the effect that no work involving a charge to capital account of $1,000 or more (instead of $10,000) shall be contracted for or commenced unless it be specifically authorized by the Division of Expenditure or unless the corporation agrees to furnish the cash at the outset without calling upon the Railroad Administration in any way for the funds, or unless the expenditure is in accordance with a definite program approved by the Director of the Division of Capital Expenditure, such as capital charges incidental to maintenance authorized by the Director of Operation, or capital charges covering the application of safety appliances designated by the Director of the Division of Operation.

REGIONAL ORDERS

The Central Western regional director has advised federal managers of a complaint received at Washington that employees riding on passes are monopolizing space in sleeping cars and that employees are making unnecessary trips.

In Circular 237, the regional director of the Southwestern region has issued instructions that where buildings have been destroyed or damaged by fire, they should not be restored or rebuilt except where necessary for safety or for the protection of the public, or where delay in restoration might work a serious hardship upon employees, since only the small structures can be built before January 1, 1920.

In Circular 232 the Southwestern regional director refers to a complaint made by the Surgeon General that the Bureau of Public Health Service and also many of the state departments of health, making examinations of water supplies used by railroads for drinking and culinary purposes, are having difficulty in securing the cooperation of railroad officers; and that containers are not promptly returned.

The regional director of the Northwestern region has

issued supplement 12 to circular 33 under date of August 14 quoting instructions from the director general as follows:

"In the absence of a written contract as to the maintenance of an industry track constructed prior to March 26, 1918, the practice of the connecting carrier prior to federal control, as applied to such track of any particular industry from the beginning of its use by such industry, shall be considered as equivalent to a written contract in accordance with such practice."

While contracts are desirable covering side tracks constructed prior to federal control and not previously covered by written agreement, the execution of such contracts is not now required by General Order 15.

The rail and fittings in that portion of the track required to be paid for by the industry may be leased to the industry with rental at six per cent on the current market value of the material, provided good and sufficient security is furnished to cover the return of such material and that the rental be paid annually in advance.

CUTTING AND WELDING WITH HYDROGEN GAS

WHILE ACETYLENE in combination with oxygen is widely used for welding and cutting, there are certain disadvantages in the process due to the explosive character of the acetylene. In order to eliminate these disadvantages the Carbo-Hydrogen Company of America, Pittsburgh, Pa., has developed a gas known as carbo-hydrogen, with the view to furnishing an efficient and safe medium for use in cutting and certain classes of welding.

Carbo-hydrogen is a product of the destructive distillation of suitable hydro-carbons and has a general analysis of 85 per cent hydrogen, the balance being light hydro-carbons. It is a fixed gas, permanent under all weather conditions, and does not solidify or leave any residue in the tank. Being a combustible gas and not explosive, it is easy to use and safer than acetylene. No air or free oxygen is mixed with the gas in the process of manufacture.

Gases having a high B. t. u. value are necessarily slow in combustion and require a longer time to deliver a given amount of heat and a larger expenditure of oxygen than gases having a higher rate of combustion. For this reason a smaller portion of oxygen is needed for a given amount of work where carbo-hydrogen is used. The gas maintains a very high rate of combustion and ignition and consequently generates an intense heat.

In cutting ferrous metals gases having a high carbon content change the character of the metal at the cut, hardening it so that machining or caulking is exceedingly difficult. It is claimed that metal cut by the carbo-hydrogen process, on the other hand, retains soft surfaces that can readily be worked, while the absence of slag increases the speed of cutting and produces a smoother surface.

The use of carbo-hydrogen for heavy welding on steel parts is not advocated by the manufacturers, although the process is said to be superior to the oxy-acetylene flame for welding softer metals, such as cast iron, copper, brass and aluminum. Carbo-hydrogen is also used on light gage iron and steel welding and for lead burning.

Among the advantages of carbo-hydrogen may be mentioned the absence of dangerous and poisonous gases in the products of combustion which often prove injurious to operators. Being composed largely of pure hydrogen, carbo-hydrogen burns almost entirely to water, while the combustion of acetylene and oxygen produces at least 50 per cent carbon monoxide. Carbo-hydrogen is supplied in drawn steel cylinders compressed to 1,800 lb. per sq. in. The working pressure varies from 5 to 10 lb. per sq. in., making it possible to withdraw practically all the gas from the tank.

THE MATERIAL MARKET

THERE SEEMS TO BE no hope for the man who is looking for lower prices. Lumber is still going up; the prices of steel remain fixed except on a few items which are advancing; cement prices are holding firm. There is more activity in some lines than others. Steel fabrication is rather slow at present, owing to the inactivity of railroad bridge work and the great building tieup at Chicago, although the total tonnage under contract is considerable. Contracts for such bridge work as is now being done are going at a close margin. Plate girder bids are taken around $90 a ton. On the other hand, wrought iron and steel pipe are practically out of the market because of the great demand caused by the oil field development. Boat spikes are now quoted at $4 instead of $3.85. Structural rivets sell at $3.90 instead of $3.75. Cast iron pipe has advanced $2. Warehouses at Baltimore and Philadelphia have reverted to the war plan of charging $1 plus the freight rate per 100 lb. over the Pittsburgh mill prices. Iron tie plates at Chicago have advanced from $2.75 to $2.90. Scrap has advanced all along the line, as indicated by the table below, in which most items are from $2 to $5 higher than those published last month.

Current quotations for iron and steel items of interest in the maintenance of way department are given below:

	Prices in Cents Per Pound	
	Pittsburgh	Chicago
Track spikes	$ 3.35	$ 3.62
Track bolts	4.35	4.62
Angle bars	2.75	2.75
Tie plates, steel	...	2.75
Tie plates, iron	...	2.90
Wire nails	3.25	...
Barb wire, galvanized	4.10	...
Cast iron pipe, 6 in. or larger, per ton	...	53.80
Plates	2.65	2.92
Shapes	2.45	2.72
Bars (steel)	2.35	2.62

Following are current quotations in the scrap market for old track materials:

	Pittsburgh	Chicago	St. Louis
	Per Gross Ton		
Rail, relayers	$38.00-$40.00	$35.00-$45.00	
Rail, rerolling	22.50- 23.50	29.90- 30.00	$26.00-$26.50
Rail, less than 3 ft. long.		23.50- 24.00	21.00- 21.50
Frog and switch, cut apart		20.50- 21.50	18.00- 18.50
	Per Net Ton		
Angle bars, steel		20.50- 21.00	16.00- 16.50
No. 1 railroad wrought	22.00-23.50	20.50- 21.50	17.00- 17.50

The lumber manufacturers are still confident that their prices will remain stable or even advance still further. This condition is said to result from a supply of lumber that is 50 per cent below normal. The shortage in world production is said to be 250,000,000 ft. Another influence is the high export price that can be obtained. As a measure of the advance, the base price on some items of coast lumber have advanced 50 per cent above the low figure prevailing at the time that the government discontinued its wooden shipbuilding program. Furthermore, the large supplies which the government accumulated during the war are being rapidly disposed of.

Cement prices have not changed during the month and are as follows:

Chicago	$2.00	Cleveland	$2.32
Pittsburgh	2.05	Indianapolis	2.27
Milwaukee	2.11	Duluth	2.10
St. Paul	2.25	Toledo	2.12

THE MAINTENANCE OF WAY department is now approaching its most active convention season, three of the societies holding their annual meetings in the next two months. The programs for these meetings are assuming tangible form and they are presented below in abstract.

THE ROADMASTERS' ASSOCIATION

Present indications point to a record-breaking attendance at the convention of the Roadmasters' and Maintenance of Way Association at the Auditorium hotel, Chicago, September 16-18, inclusive. The Railroad Administration has addressed a letter to federal and general managers as follows:

"It is desired that members of this association attend this convention as far as possible and at least for a portion of the time, if they can be spared without detriment to the service. Also some roadmasters and supervisors who are not members may be spared to attend; if so, they should be allowed to go. It may be possible that some of the higher officials of the maintenance of way department can attend some of the sessions, as the practical benefits derived from this convention are quite helpful to those who attend. In order to stimulate the educational feature of this convention, it would be advisable to issue instructions to have those in attendance take notes on matters of interest and render reports upon their return to their superior officers. It will be proper to follow your usual practice with reference to time expense and transportation to those who attend."

The tentative program which has been prepared is as follows:

TUESDAY MORNING, SEPTEMBER 16

9:30 a. m.—Convention called to order. Reports of officers and appointment of committees on nominations, resolutions, auditing, etc.
10:30 a. m.—Committee Report—"The Maintenance of Passenger and Freight Terminals," C. E. Denney, C. C. C. & St. L., chairman.
12:30 p. m.—Adjournment.
2:00 p. m.—Paper—"The Labor Supply," by Hugh Reid, U. S. Dept. of Labor, Washington, D. C.
3:30 p. m.—Committee Report—"Conservation of Lumber in Highway, Street and Farm Crossings," P. M. Dinan, chairman.
5:30 p. m.—Adjournment.
7:30 p. m.—Moving pictures showing the Manufacture of Rail Steel.

WEDNESDAY, SEPTEMBER 17

9:30 a. m.—Committee Report—"Roadway Ditching," J. P. Corcoran, C. & A., chairman.
11:00 a. m.—Paper—"Methods of Improving Efficiency of Track Labor," by C. A. Morse, chief engineer, Chicago, Rock Island & Pacific.
12:30 p. m.—Adjournment.
2:00 p. m.—Paper—"Use of Labor Saving Equipment," by J. B. Baker, supervisor on general manager's staff, Pennsylvania Railroad.
3:30 p. m.—Paper—"The Equation of Track Values," by W. P. Wiltsee, principal assistant engineer, Norfolk & Western.
4:30 p. m.—Adjournment to inspect exhibit of track appliances.
6:30 p. m.—Annual dinner.

THURSDAY, SEPTEMBER 18

9:30 a. m.—Completion of committee reports.
10:30 a. m.—Business session.

The Track Supply Association has equally flattering prospects for a large and instructive exhibit, all of the available space now being assigned. Over 50 firms have arranged to present exhibits. As in past years, a special attempt is being made to present displays of materials in actual service rather than models, photographs and catalogues.

LIST OF EXHIBITORS

Air Reduction Sales Company, New York.
Ajax Forge Company, Chicago.
American Hoist & Derrick Company, St. Paul, Minn.
American Steel & Wire Company, New York.
American Valve & Meter Company, Cincinnati, Ohio.
Anchor Company, New York.
Balkwill Manganese Crossing Company, Cleveland, Ohio.
Bethlehem Steel Company, Bethlehem, Pa.
Blaw-Knox Company, Pittsburgh.
Buda Company, Chicago.
Carbic Mfg. Company, Duluth, Minn.
Carnegie Steel Company, Pittsburgh, Pa.
Chicago Malleable Casting Company, Chicago.
Cleveland Frog & Crossing Co., Cleveland.
Crerar, Adams & Company, Chicago.
Dressel Railway Lamp Works, New York.
Duff Mfg. Company, Pittsburgh, Pa.
Elliott Frog & Switch Company, St. Louis, Mo.
Fairbanks, Morse Company, Chicago.
Fairmont Gas Engine & Railroad Motor Car Company, Fairmont, Minn.
Hauck Mfg. Company, New York.
Hayes Track Appliance Company, Richmond, Ind.
Ingersoll Rand Company, New York.
Kalamazoo Railway Supply Company, Kalamazoo, Mich.
Lackawanna Steel Company, Lackawanna, Pa.
Lundie Engineering Corporation, New York.
Luther Grinder Mfg. Company, Milwaukee, Wis.
Madden Company, Chicago.
Milburn, Alexander Company, Baltimore, Md.
Mudge & Co., Chicago.
National Lock Washer Company, Newark, N. J.
National Malleable Castings Company, Cleveland, Ohio.
North American Engine Company, Algona, Iowa.
Oxweld Railroad Service Company, Chicago.
P. & M. Co., Chicago.
Pocket List of Railroad Officials, New York.
Positive Rail Anchor Company, Marion, Ind.
Q. & C. Company, New York.
Rail Joint Company, New York.
Railroad Supply Company, Chicago.
Railway Review, Chicago.
Ramapo Iron Works, Hillburn, N. Y.
Reading Specialties Company, Reading, Pa.
Rodger Ballast Car Company, Chicago.
Simmons-Boardman Publishing Company, New York.
Sellers Mfg. Company, Chicago.
Southern Railway Supply & Equipment Company, St. Louis, Mo.
Track Specialties Company, New York.
Union Switch & Signal Company, Swissvale, Pa.
United States Switch Company, Eau Claire, Wis.
Verona Tool Works, Pittsburgh, Pa.
Wharton, William, Jr., Company, Inc., Easton, Pa.
Wyoming Shovel Works, Wyoming, Pa.

BRIDGE AND BUILDING ASSOCIATION

Plans for the twenty-ninth annual convention of the American Railway Bridge and Building Association, which will be held at the Statler hotel, Cleveland, on October 21-23, inclusive, are rapidly assuming tangible form. Nearly all of the committee chairmen have advised that reports will be completed in ample time for presentation at the convention, while a number of individual papers are also being arranged for.

The program contemplates that an evening session will be held on Tuesday, at which moving pictures of engineering activities of special interest to the members of this association will be presented. Following this the work of the railway engineering regiments overseas in the building of bridges and other structures under wartime conditions will be described by an officer of one of the railway regiments.

Wednesday afternoon will be devoted to the inspection of the Orange avenue L. C. L. freight station of the New York Central Lines at Cleveland, one of the largest and most modern structures of its kind in the country, and the ore dock of the Pennsylvania Lines. Following adjournment on Thursday, a trip is planned to the rubber works at Akron, Ohio.

The Bridge and Building Supply Men's Association will present an exhibit in connection with the convention. Although letters were sent to the members of this association only a couple of weeks ago, over 25 firms have already made reservations for space. A special effort will be made this year to present a working exhibit.

MASTER PAINTERS' ASSOCIATION

The Maintenance of Way Master Painters' Association will hold its sixteenth annual convention at the American Annex Hotel, St. Louis, Mo., on October 21-23, inclusive. Through a special effort of the executive committee, the assignment of work to committees and individual members was made much earlier than usual, thereby affording opportunnty for more careful preparation of the papers and reports to be presented at the convention. In selecting subjects special attention was given to problems now confronting the master painters in dealing with labor, materials, equipment and working conditions. The association is also fortunate in securing the services of three well-known speakers on subjects of special interest to the maintenance painter. The outline of the program as it has been arranged to date is given in full below:

TUESDAY, OCTOBER 21—10:00 A. M.

Opening Addresses and Reports of Officers.

Memorial to J. E. Johnson, master painter, C. B. & Q., Camp Point, Ill., who died in the country's service.

2:00 p. m.

Committee Report—Tools and Equipment That Are Essential to the Average Maintenance of Way Painter.

Paper—How to Secure Good Results Under Extreme Temperatures; by F. C. Rieboldt, master painter, C. M. & St. P., Milwaukee, Wis.

Paper—The Grainer of the Past and Present; by Martin Kane, supervisor painting, D. & H., Albany, N. Y.

Committee Report—Economy in Handling Tools and Material.

WEDNESDAY, OCTOBER 22—9:30 A. M.

Paper—Possibilities of Arranging Work so as to Keep Men Employed Throughout the Year; by Harry E. Jones, master painter, C. C. C. & St. L., Wabash, Ind.

Stereopticon Lecture—Vocational Training; by Dr. Louis Ireton, chairman of the International Trade Education Development Committee, New York City.

Report on Results Secured With Spray Painting in Economy of Work and Permanence of Coatings; by H. S. Bird, master painter, P. & R., Philadelphia, Pa.

Report on The Extent of the Use of Paint Sprayers in Railway Painting; by C. H. Barkley, master painter, I. C., Carbondale, Ill.

THURSDAY, OCTOBER 23—9:30 A. M.

Paper—The Limited Palette; by G. W. Thompson, chief chemist, Research Laboratories, National Lead Company, Brooklyn, N. Y.

Committee Report—Housing and Boarding.

Paper by H. A. Gardner, director, Institute of Industrial Research, Washington, D. C.

Business Session.

AMERICAN RAILWAY ENGINEERING ASSOCIATION

The advisability of the American Railway Engineering Association continuing its present working arrangement with the American Railroad Association has been questioned by George D. Hill, assistant valuation engineer of the Seaboard Air Line, and a member of the former organization. Mr. Hill has sent a letter to the members of the engineering association in which he calls attention to the present working arrangement between the two organizations whereby the committees of the American Railway Engineering Association have been appointed as similar committees of the newly organized American Railroad Association and have formed a part of the engineering section of the American Railroad Association. He calls attention to the vote of the members taken last July in which 577 voted against the consolidation of the engineering association with the American Railroad Association, while 83 voted for it, some of whom qualified their vote by adding "only during the period of the war." Mr. Hill states that the working arrangement "has the ratification of *only* the Board of Directors of the American Railway Engineering Association and *perhaps* a majority of the small representation of members present at the last annual meeting." To ascertain whether he represents the feeling of the majority of the members of the engineering association that this action should be recalled before it is too late; that "a complete divorce of the American Railway Engineering Association from the American Railroad Association be accomplished," and that the American Railway Engineering Association should be returned to its status quo before the war a ballot is attached on which the members are urged to express their opinions.

AMERICAN WOOD PRESERVERS' ASSOCIATION

Members of the Service Records committee and of the Committee on Wood Preservation of the American Railway Engineering Association are planning to inspect the treated timber now being taken out of the Indiana approach to the Henderson, Ky., bridge of the Louisville & Nashville, crossing the Ohio river late in September. This timber has been in this structure for many years and is now being removed in the reconstruction of the entire approach. It is expected that the party will also make an inspection of other structures of treated timber now in service on other lines of the Louisville & Nashville, particularly along the Gulf of Mexico, while it will also inspect the New Orleans & Northeastern trestle crossing Lake Ponchartrain and the Port Bolivar wharves of the Atchison, Topeka & Santa Fe near Galveston.

PRESIDENT ADDRESSES UNIONS

THE FOLLOWING is an abstract of President Wilson's statement to the shop men on August 25, but is of equal importance to the maintenance employees:

"We are face to face with a situation which is more likely to affect the happiness and prosperity, and even the life, of our people than the war itself.

"The primary first step is to increase production and facilitate transportation, so as to make up for the destruction wrought by the war, and so as soon as possible relieve our people of the cruel burden of high prices.

"The government has taken up with all its energy the task of bringing the profiteer to book, making the stocks of necessaries in the country available at lowered prices, stimulating production, and facilitating distribution, and very favorable results are already beginning to appear.

"All that I am now urging is that we should not be guilty of the inexcusable inconsistency of making general increases in wages on the assumption that the present cost of living will be permanent at the very time that we are trying with great confidence to reduce the cost.

"I am aware that railroad employees have a sense of insecurity as to the future of the roads, and have many misgivings as to whether their interests will be properly safeguarded. The employees may rest assured that during my term of office * * * I shall not fail to exert the full influence of the executive to see that justice is done them."

GENERAL NEWS DEPARTMENT

The bill appropriating $17,000,000 additional to complete the construction of the Alaska railroad has been made the subject of a favorable report by the House committee on territories.

The bill to repeal the daylight saving law, effective with the change of the clocks in October, was repassed over the President's veto on Wednesday, August 20, by the Senate after the House had taken similar action the day before.

The Delaware Railroad (Pennsylvania System) extending from Wilmington, Del., southward 95 miles, was compelled to suspend freight traffic for several days in the week of August 10 because of floods and washouts. The total damage to all property was about $2,000,000.

Secretary Lane of the Interior department has submitted a report to Congress recommending the enactment of a bill to forfeit right-of-ways heretofore granted to railroad companies through Indian reservations in all cases where the grantees have failed to utilize the land for five years.

The troop movements for the month of July aggregated 949,660 soldiers carried on the railroads within the United States and exceeding the number of men carried in June by 35,000 men. This number included 299,009 men returning from overseas, and 411,642 men discharged from the army.

Recent forest fires in Idaho and Montana, while destroying 45,064 acres of forest and coming within less than two miles of the railroads in several places, caused practically no loss to the Great Northern, the Chicago, Milwaukee & St. Paul or the Northern Pacific, the three roads traversing the area affected.

The Board of Directors of the Chamber of Commerce of the United States has issued a statement calling attention to the overwhelming disadvantages of government ownership of the railroads as contemplated in the Plumb plan in the way of retarded development, increased cost of transportation, political influences, etc.

A recent bulletin of the American Association of Engineers states that the organization now has 35 railroad sections ranging from 20 to 250 in the number of members. The Pennsylvania Railroad section of which F. M. Sawyer, engineer of construction at Pittsburgh is chairman, has the largest number, while the Southern Railway section has 200 members.

Standard freight cars, many of which have been standing on side tracks waiting for the railroads to accept them, are now being put into operation as a result of favorable progress being made in working out the plans of financing this equipment by the National Equipment Corporation. Growing demand for cars has also had an influence in expediting the prosecution of this plan.

Isaiah Hale, safety superintendent of the Atchison, Topeka & Santa Fe, in a recent bulletin devoted to the interest of the safety-first movement, says that 40 per cent of the injury reports which passed over his desk during a ten-day period consisted of mashed toes. "No favorites are played," says Mr. Hale, "it is the major toe as often as the little buck private toe down at the foot.

Of 233 automobile accidents at grade crossings on the Southern Pacific, the Western Pacific and the Tidewater Southern, 30 cars stalled on the crossing and were struck by trains; 111 attempted to cross almost immediately in front of and were struck by trains; 59 ran into trains; 1 skidded into train; 19 ran into and broke down crossing gates lowered to protect them from passing trains; 3 ran into and injured flagmen; 4 ran into cattle-guards or crossing signs; and 6 ran over the end of track or were not sufficiently in the clear.

Tentative valuation reports have been issued by the Bureau of Valuation of the Interstate Commerce Commission on the New Mexico Midland, the Ray & Gila Valley, the Quincy Western, the Tonopah & Tidewater, the Bowdon Railway, the Georgia Southern & Florida, the Georgia Northern, the Death Valley, the Dover & Southbound, the Carolina Railroad, the Hampton & Branchville, the Arizona Southern and the Sylvania Central.

The Eighth Annual Safety Congress of the National Safety Council is to be held at Cleveland, Ohio, on October 1, 2, 3 and 4. About 3,000 men and women are expected to attend and 160 of these are named in the list of speakers. There are to be four general sessions, four round tables and 35 sectional meetings. All of the general sessions are to be in the afternoon and the sectional meetings in the forenoon. The first meeting of the Steam Railroad section will be held at 9:30 a. m., October 2, and R. C. Richards, chairman of the section, will preside.

Walker D. Hines, director general of railroads, announces that a "National Railroad Accident Prevention Drive" will be started on October 18 at 12:01 a. m. and will be continued until October 31 at midnight, to be conducted under the supervision of the Safety Section. All officers and employees are expected to give their hearty support.

This drive follows the very satisfactory results of certain "no accident campaigns" already carried out which are summarized as follows:

Region	Total No. of Employees	Casualties. 1919	Casualties 1918
Southern, Jan. 19-25.....	230,000	77	466
Southwestern, May 1-31.....	174,884	646	1,475
Central Western, June 22-29.	327,000	100	456
Northwestern, June 22-29....	274,234	119	481

In the Southern region 28 out of 45 railroads reported no accidents; in the Southwestern region 12 roads were in this class, and in the Central-Western 47 out of 67 showed clear records. In the Northwestern region this was true of 50 out of 63 lines.

STREET CAR STRIKES IN THREE CITIES AFFECT RAILROADS

From July 29 to August 2 inclusive the steam railroads entering Chicago carried the bulk of the local transportation which had been thrown out of its usual channels by a strike of the street car and elevated railway employees. The railroads carrying the bulk of the normal suburban business doubled, trebled and even quadrupled their regular number of trains. It is estimated that nearly three quarters of a million people were carried by the roads each day during the strike period. Experience with a similar situation four years ago enabled the roads to perfect operating arrangements and handle the increased business with a minimum of confusion.

A similar situation arose in New York City, on August 18, when service was discontinued on the elevated and subway service in the boroughs of Manhattan and Bronx. While the surface lines continued to run, they were totally inadequate to handle morning and evening rush-hour crowds to and from Bronx, and also the northern end of Manhattan Island. As a result the New York Central and the New York, New Haven & Hartford were compelled to provide considerable emergency transportation in and out of the Grand Central station. The total number of persons handled at the terminal that day was 189,838, as compared to a normal number of about 100,000.

A street car strike in Pittsburgh, Pa., during the week of August 10, threw a large volume of passenger traffic temporarily on the steam railroads entering the city. The United States Railroad Administration sent 127 passenger coaches from Philadelphia and from Washington for use in the Pittsburgh region. These coaches moved over the Pennsylvania Railroad in seven trains.

PERSONAL MENTION

GENERAL

Colonel Frederick W. Green, assistant to the president of the St. Louis Southwestern Railway Company and the St. Louis Southwestern Railway Company of Texas, who is an engineer by training, has been appointed vice-president of these companies, with headquarters at St. Louis, Mo., and his former position has been abolished.

ENGINEERING

T. C. Fisher has been appointed corporate engineer of the Central Railroad Company of New Jersey, with headquarters at New York.

C. S. Ogilvie has been appointed assistant engineer of the Montreal division of the Grand Trunk, with headquarters at Montreal, Que., succeeding **C. Murgatroyd,** resigned.

A. C. Bradley, who has recently been discharged from military duty, will resume his duties as division engineer on the Chicago, Rock Island & Pacific, with headquarters at El Reno, Okla., succeeding **G. H. Pash,** assigned to other duties.

G. A. Carroll, who has been discharged from military service, has been appointed division engineer and master carpenter of the St. Louis division of the Chicago, Rock Island & Pacific, with headquarters at Eldon, Mo., succeeding **W. A. Wallace** who has been appointed assistant engineer of the Amarillo division of that road, with headquarters at Amarillo, Texas. Previous to his entrance into military service in May, 1918, Mr. Carroll was division engineer on the El Paso division, with headquarters at Dalhart, Texas.

Colonel Frederick Mears has been appointed by the President as chairman and chief engineer of the Alaskan Engineering Commission, in charge of the construction of the government railroad in Alaska. Colonel Mears was formerly a member of this commission but retired to return to active duty with the army during the war and has been connected with the management of the American railroad lines in France. Previous to his original appointment as a member of the Alaskan Engineering Commission on its formation several years ago he was with General Goethals during the construction of the Panama canal and the Panama railroad. **William C. Edes,** heretofore chairman, has been appointed consulting engineer to the commission.

C. F. Hinchman has returned from military service and resumed his position as engineer maintenance of way of the Indianapolis Terminal division of the Cleveland, Cincinnati, Chicago & St. Louis with headquarters at Indianapolis, Ind., in place of **H. L. Arbuckle.** The office of district engineer at Springfield, Ohio, has been abolished and **W. S. Burnett** has resumed his duties as engineer maintenance of way of the Cincinnati-Sandusky division with headquarters at Springfield, Ohio, succeeding **L. B. Elliott,** who has been transferred to the Peoria and Eastern division with headquarters at Indianapolis, Ind., as acting engineer maintenance of way. The office of district engineer has been abolished at Galion, Ohio, and **W. C. Kegler** has resumed his duties as engineer maintenance of way of the Cleveland-Indianapolis division with headquarters at Galion, Ohio, succeeding **J. E. Kissell,** who will resume his duties as engineer maintenance of way of the Cairo division with headquarters at Mount Carmel, Ill., in place of **E. J. Bayer.**

R. B. Reasoner has recently returned from duty overseas and resumed his former duties as division engineer of the Utah division of the Oregon Short Line, with headquarters at Pocatello, Ida., and **William Travers,** who had been appointed division engineer during the absence of Mr. Reasoner, has resumed his former duties as assistant division engineer on the Utah division. **Harry B. Orr,** who has also returned from military service, resumed his duties as assistant division engineer on the Idaho division, on July 1, 1919, and later resigned to take up work with the City of Pocatello and his place of assistant division engineer is now filled by **J. C. Bell** who held this position during Mr. Orr's absence. **T. L. Pidcock** has resumed his former duties of chief draftsman, maintenance of way department, after service overseas. **E. B. Hunley** has resumed his duties as assistant engineer on the Idaho division after serving with the 545th Engineers in France. **A. H. Hoult** has been appointed assistant engineer on the Montana division with headquarters at Idaho Falls, Ida., in place of **R. B. Johnson** who has resigned to enter private practice at Idaho Falls, Ida.

W. H. Bevan has been appointed division engineer of the Ottawa division of the Canadian National Railways, with headquarters at Ottawa. **R. B. Jennings** has been appointed division engineer of the Toronto division, with headquarters at Rosedale, Ont. **S. McIlwain,** formerly resident engineer, with headquarters at Capreol, Ont., has been appointed division engineer of the Nipissing division, with the same headquarters. **G. P. MacLaren** has been appointed district engineer of the Ontario district, with headquarters at Toronto. **H. K. Morrison,** formerly resident engineer on the Superior division, has been promoted to division engineer, with office at Hornepayne, Ont.

TRACK

Iver B. Nelson has been appointed roadmaster of the Spokane division of the Great Northern, with headquarters at Hillyard, Wash., in place of **W. D. McLaughlin,** resigned.

T. A. Allen has been appointed roadmaster of the Benson district, Tucson division of the Southern Pacific, with headquarters at Benson, Ariz., succeeding **T. A. Dean,** assigned to other duties.

W. A. Kennon, general roadmaster of the Southern Kansas division of the Missouri Pacific, with headquarters at Coffeyville, Kan., has been transferred to Falls City, Neb., in place of **R. H. Hallsted,** who has been transferred to Coffeyville.

C. A. Drawheim has been appointed roadmaster on the Chicago, Milwaukee & St. Paul, with headquarters at Aberdeen, S. D., succeeding **Frank Phelan,** resigned. **W. Hickey,** roadmaster at Prairie du Chien, Wis., has been transferred to Madison.

Walter E. Debler has been appointed general maintenance of way inspector on the Union Pacific, with hearquarters at Omaha, Neb. **Herbert R. Carey** has been appointed general inspector maintenance of way machinery and roadway equipment of that road, with the same headquarters.

William McDermid has been appointed roadmaster on the Great Northern, with jurisdiction from Sioux Falls to Watertown, S. D., and headquarters at Sioux Falls, S. D., succeeding **J. S. Briet,** transferred to have authority over the territory from Willmar to Ihlen, Minn., with headquarters at Marshall, Minn., in place of **G. Ingebretson,** assigned to other duties.

J. W. Kern, who has returned from military service abroad, has been appointed roadmaster on the Illinois Central, with headquarters at Water Valley, Miss., succeeding **C. A. Maynor,** who has been transferred to Memphis, Tenn., to take the place of **J. L. Downs.** Mr. Downs has been transferred to Champaign, Ill., to succeed **B. F. Oren,** who has resigned to enter private business.

L. J. Gilmore, who was granted a leave of absence to enter military service, has resumed his duties as roadmaster on the Superior-Mesabi division of the Great Northern, in charge of the line from Floodwood to Cass Lake, Minn., and with headquarters at Grand Rapids, succeeding **J. M. Doyle,** assigned to other duties.

C. E. Anderson has been appointed roadmaster on the Chicago, Burlington & Quincy, in charge of the territory between Galesburg, Ill., and Ottumwa, Iowa, with headquarters at Burlington, Iowa, succeeding **J. T. Corcoran,** who has had jurisdiction changed to the territory from Burlington to Quincy, Ft. Madison to Batavia and Mediapolis to Washington.

W. Bibby, supervisor of track, District 4, of the Montreal division of the Grand Trunk, has had his jurisdiction changed to cover section 516, Cornwall, east to Montreal West sta-

tion, with headquarters at Montreal, Que. **J. B. Franklin,** supervisor of track, District 5, of the Montreal division of that road, has had his jurisdiction changed to cover sections from Cornwall, Ont., including section 517, to Manitoba yard, with headquarters at Brockville, Ont. **A. A. Snyder** has been appointed acting supervisor of track, District 4, of the Montreal division in place of Mr. Bibby.

Charles Hayes, acting roadmaster on the Duluth-Superior division of the Minneapolis, St. Paul & Sault Sainte Marie, with headquarters at Moose Lake, Minn., has been transferred to the Third district of the Wisconsin & Peninsula division, with headquarters at Rhinelander, Wis. **E. T. Shea,** track laying and extra gang foreman, has been promoted to roadmaster of the Second district of the Duluth-Superior division, with headquarters at Moose Lake, Minn.

S. O. Lund, assistant division roadmaster of the Sioux City division of the Great Northern, with headquarters at Sioux City, Iowa, who was promoted to division roadmaster with the same headquarters, as noted in last month's issue, was born in Norway on February 20, 1881. He entered railway service on the Northern Pacific in 1897 as a section laborer. On February 25, 1899, he was promoted to section foreman which position he held for nine years, entering the employ of the Great Northern in September, 1908, as section foreman on the Dakota division, with headquarters at Crookston, Minn. Later he was promoted as extra gang foreman, and on January 1, 1913, was promoted to assistant roadmaster, with headquarters at Grand Forks, N. D. In April, 1918, he was transferred to the Sioux City division as assistant division roadmaster, which position he held until his recent promotion.

Edward B. Finnessey, yard foreman on the Denver & Rio Grande, with headquarters at Pueblo, Colo., who was promoted to roadmaster with headquarters at Canon City, Colo., as noted in last month's issue, was born on September 1, 1868, at Lighton, Iowa. He entered railway service in 1882 as a water boy with the Chicago, Rock Island & Pacific and served on that road in various capacities until 1891 when he entered the employ of the Great Northern as a section and extra gang foreman. From 1899 to 1903 he was employed in the Minneapolis yards of the Minneapolis & St. Louis as foreman. In the latter year he was appointed foreman of the Bonne Terre yard of the Mississippi River & Bonne Terre, later becoming roadmaster of that road. In 1906 he again entered the employ of the Great Northern, this time as general foreman and roadmaster and in April, 1914, he was employed by the Spokane, Portland & Seattle as roadmaster at Vancouver, Wash., and in August, 1918, he was employed by the Union Pacific as general foreman and roadmaster. Later he entered the employ of the Denver & Rio Grande as yard foreman, which position he held until his recent appointment.

J. A. Sullivan has been appointed roadmaster on the Northern division of the Great Northern, in charge of track between Wylie and Warroad, Minn., with headquarters at Red Lake Falls, Minn., in place of **Thomas Wilson,** assigned to other duties. **Harry C. Coulton** has been appointed roadmaster on the Marcus division, with district from Danville to Princeton and Curley to Republic, Wash., and headquarters at Oroville, Wash., succeeding **S. Roper,** who has been transferred to the Marcus division, with district from Dean to Danville and Grand Forks to Phoenix, Wash., and headquarters at Marcus, Wash. Mr. Roper takes the place of **S. E. Allen,** transferred to the Spokane division, on the district from Harrington to Columbia River, Wash., with headquarters at Wilson Creek, Wash., in place of **J. C. Davis,** resigned. **C. T. Christenson** has been appointed roadmaster on the Butte division, with district from Great Falls to Helena, Mont., and headquarters at Great Falls, Mont., vice **D. Deneen,** transferred. **Joseph D. Boyes** has been appointed roadmaster on the Kalispell division, in the district from Cut Bank to Essex, Mont., with headquarters at Essex, Mont., succeeding **Iver B. Nelson,** resigned.

PURCHASING AND STORES

G. H. Greer, storekeeper on the Yazoo & Mississippi Valley, with headquarters at Vicksburg, Miss., has been appointed storekeeper for the Gulf, Mobile & Northern, with headquarters at Mobile, Ala., vice **R. C. Brown,** resigned.

CONSTRUCTION NEWS

The Baltimore & Ohio has given a contract to the Vang Construction Company, Cumberland, Md., for the masonry work required in the reconstruction of its Allegheny river bridge, at Thirty-third street, Pittsburgh, Pa.

The Canadian Pacific has asked for bids for grading work on lines in western Canada, as follows: From Wymark, Sask. (mileage 15.8 Vanguard subdivision), east for 25 miles; from Lanigan, Sask., north 50 miles; from Rosetown Sask., south 25 miles; from Vidora, Sask. (mileage 56.6 Govenlock subdivision), southeasterly 30 miles; from Milden, Sask. (mileage 22.3 Kerrobert subdivision), west 34 miles. In addition bids have been asked for grading from Russel, Man., north for 12 miles and a contract has been let to the John Stewart Construction Company for grading a line from Acme, Alta., to Drumheller, 37 miles.

This road has completed plans for the construction of a new station at Three Rivers, Que. The building as designed will be of the French chateau style and of fireproof construction.

The Chicago & Alton has submitted a proposition to the secretary of the Nutwood Drainage and Levee district, of Illinois, for the construction of a six-mile extension from Titus, Ill., south into the Nutwood district, with a branch line of one mile to the east bank of the Illinois river opposite the town of Hardin.

The Chicago & North Western will start work soon on the elimination of two grade crossings by the construction of one mile of new highway east of its tracks, four miles south of Racine, Wis. The work will also involve some incidental changes to the Chicago & Milwaukee electric line. The approximate cost is $25,000.

This company has entered into a contract with the city of Kenosha, Wis., for its portion of the cost of the Main street improvement project, which will include a 200-ft. viaduct and a 140-ft. bascule bridge. As the viaduct extends over industrial tracks owned by the Chicago & North Western, its share of the cost of the improvement will amount to $40,000, while the cost to the city will be $310,000.

This road is also required to do considerable track elevation at Kenosha as the result of an order of The Railway Commission of Wisconsin passed on July 11, 1919. This calls for the elevation of 2.4 miles of its main line from Solma to North streets, and on the Kenosha division from the main line junction to Fremont street, a distance of 0.26 miles. The work will involve 15 subways on the main line, and 1 subway on the Kenosha division. All the work inside of the right-of-way will be paid for by the railroad except changes in public utilities, while the city will pay for all pavement and street improvements and sewers outside of the right-of-way and assume the responsibility for all changes in property. The estimated cost of the work is $2,650,000.

The Chicago Union Station Company has awarded the contract to the Mellon, Stewart & Nelson Company, Chicago, for the grading and construction of six approach tracks to the Union Station and two freight tracks for the Chicago & Alton freight terminal and the Pittsburgh, Fort Wayne & Chicago freight connections in the territory between Twelfth and Van Buren streets. The work includes underground construction of cables for interlocking and necessary sewerage. The contract amounts to approximately $200,000, not including material, which is furnished by the Station Company.

The Grand Trunk Western Lines are enlarging their freight handling facilities at Belsay, near Flint, Mich., where the construction of switching yards with a capacity of 500 to 600 cars has already been started. The layout will also provide for a large roundhouse which will be built in the future.

The Missouri, Kansas & Texas is now constructing about 3½ miles of second track through the town of Burkburnett, Okla., in order to relieve the congested traffic conditions that have existed there since the development of the oil fields.

The Missouri Pacific has awarded a contract to the L. J. Smith Construction Company, Kansas City, Mo., for filling five bridges on the White River branch of the road near Hollister, Mo. This company has sublet the construction of 1,000 cu. yd. of reinforced concrete in culverts on this work to the J. W. McMurray Contracting Company, Kansas City.

The Moore Haven Railway has been organized to build a line from Moore Haven, Fla., on the Atlantic Coast Line, southeast along the shore of Lake Okeechobee to Ritta—26 miles. The work will include the construction of a steel bridge with a 30 ft. draw span. The promoters expect to develop a traffic in perishable truck and general farm products. The work is temporarily held up, pending the settlement of present strikes. John J. O'Brien, of Moore Haven, is president.

The Oklahoma Railway Company is now completing plans for the rebuilding of a terminal station at Oklahoma City, Okla., at an approximate cost of $250,000.

The Philadelphia & Reading has completed preliminary surveys for a proposed 12-mile freight cut-off between Sinking Springs, Pa., and Blandon, with a view of considering the feasibility of this route. The new construction will involve an expenditure of aproximately $4,000,000.

The Pennsylvania Railroad has resumed work on the construction of a belt line around Detroit, Mich., after an interruption of more than a year. Prior to the suspension of this work in 1918 the railroad had purchased right-of-way for a six-mile extension around the city of Detroit from a connection with the Pere Marquette, north of Michigan avenue to Highland Park. Three hundred acres of land have been acquired west of the River Rouge near Oakwood, Mich., where a freight yard will be located. As now designed they will have an immediate capacity of 3,850 freight cars and an ultimate capacity of 12,000 cars. It is expected that work on the entire projected extension from Toledo, Ohio, to Detroit will be resumed as soon as the railroads are returned to corporate control.

The Port Huron & Detroit is now making surveys for a single track line extending from Marine City, Mich., to Detroit, a distance of 40 miles.

The Savannah & Atlanta has awarded a contract to H. O. Young, Savannah, Ga., to build a freight warehouse in Savannah. It will be a one-story building, 40 ft. wide and 320 ft. long, having a wood frame sheathed with galvanized iron. The work is to be started at once and will cost about $10,000.

The Southern Railroad Lines (Cincinnati, New Orleans & Texas Pacific) will soon begin the reconstruction of its bridge over the Tennessee river near Chattanooga, Tenn. The work will consist of 10 single-track girder spans 105 ft. long; two double-track girder spans 105 ft. long; one double-track girder span 152 ft. long; one double-track span 88 ft. long; lifting machinery and towers to convert the present 310-ft. double-track through truss channel span into a lift span, and six additional double-track concrete piers containing approximately 5,400 cu. yd. of concrete.

The Winchester & Western has completed track laying on 28 miles of its new line, between Winchester, Va., and Wardensville, W. Va., 40 miles, on which work was started in 1916. Track laying is now under way on about 6 miles between Shiloh and Capon Springs. The line will have maximum grades of 3 per cent, and maximum curvature of 12 deg. The Intermountain Construction Company, Winchester, Va., has the contract to build the line. The railway company expects to develop a traffic in lumber, iron, ore, livestock, fruit and forest products. W. B. Cornwell, Winchester, Va., is president, and William Morgan, chief engineer.

The Wisconsin Southern Railroad Company is planning to construct its railway over that part of its chartered line from Milwaukee to a connection with roads reaching Chicago and the belt lines around Chicago. The company has extensive charter rights in countries northeast from Madison, Wis., to Sturgeon Bay and also with counties northwest from the state line between Illinois and Wisconsin, through Kenosha, Racine, Milwaukee to Marshfield.

FOREIGN RAILWAY NEWS

A bill has been introduced in the Chamber of Deputies of France providing for the construction of two new railroads through the Vosges mountains.

The first section of the Trans-Pyrennean railroad, between Ripoll and Ribas, about five miles south of the Franco-Spanish border, was completed recently. The ceremonies marking the opening of the line were attended by leading French and Spanish government officials.

The management of the Atchinsk-Minusinsk Siberian Railway has petitioned the authorities for a loan to be used to survey a railway from Menisseisk to Tomsk and thence to Tara, a distance of 800 miles. This line will be the central section of the proposed North Siberian main line extending from Krasnufinsk eastward and paralleling the existing main line.

During the war Chile was unable to secure the materials necessary to keep her railroads in good condition, and now that steel can be obtained once more, she is considering various means of rehabilitating her lines. Disagreements as to the best methods of bringing this about have caused what seems to be a ministerial crisis which may result in the resignation of the entire Chilean cabinet, for, as the greater part of Chile's railways are operated by the Government, railroad troubles are reflected immediately in Government circles.

An order for the Danish State Railways of 2,000 tons of rail was placed with the United States Steel Products Company. If the quality of the rail proves satisfactory, it is expected that the government will accept shipments of 2,000 tons per month, not including curve rails, frogs and switches. The rail is of a special section, formerly supplied by manufacturers in England and Germany, and it is said that the purchasers experienced some difficulty in getting an American concern to roll it.

Swiss engineering experts are pressing for the immediate electrification of the railways because of the coal scarcity, which will probably last for many years. There is available in Switzerland about 4,000,000 hp. of electric energy calculated on a basis of an average working day of 15 hrs. On January 1, 1914, not more than about 500,000 hp. were actually used. The new power stations built or in process of construction from January 1, 1914, to December 31, 1918, will supply another 200,000 hp.

The Mexican Railway and the Pan American Railway, which traverse the territory between Mexico City, the Gulf of Mexico and the Isthmus, are said to have been turned back to separate management. Information from reliable sources is to the effect that the government probably will return the systems to the private owners within a month. The Mexican Railway, which controls the important line from Vera Cruz to Mexico City, is a British-owned property which was handed over to the Carranza Government on April 3, 1917. The stock of the Pan American Railway is owned by the National Railways of Mexico.

The railways commissioner of South Australia at Adelaide recently advertised for bids for the construction of a line of 5-ft. 3-in. gage railway from Long Plains to Snowtown, South Australia, a distance of 41 miles. The work is to be completed within 18 months from the date of contract. Although the time was too short for American railway contractors to bid on the actual construction of the line, commerce reports suggest that American manufacturers of railway supplies and equipment should send their catalogues and export price lists to C. J. Boykett, secretary, Railways Commissioner, Adelaide, South Australia.

The Imperial Government Railways of Japan have issued a 200-page book in English on "Railway Nationalization in Japan." It is a general review of 10 years' progress of the Japanese Railways under unified state management from 1907-8 to 1916-17, including the report for the fiscal year

1916-17. It is profusely illustrated and in addition to giving the detailed figures of finances and operation gives also a history and description of the Japanese lines, details concerning the stations, cars and locomotives, etc., information concerning the through traffic arrangements to China, Manchuria, Russia, etc., as well as data concerning the wages and treatment of employees, etc. The book is especially interesting to American readers, however, because of the descriptions and diagrams given of the equipment in use and other valuable information relating to the physical and traffic characteristics of the Japanese system.

The Russian Railway System threatens to collapse, owing to the fact that no repairs have been effected since the revolution. The station buildings are for the most part deserted and the signaling apparatus no longer works, owing to the lack of spare parts to replace those worn out. The bridges and track are also in a state of decay and have in some cases been badly damaged as a result of civil war. The work of repair is often hindered by the passive resistance of railway workers antagonistic to the Soviet regime. For lack of raw material, the number of engines built in 1918 was considerably reduced. In 1917, 520 locomotives were built in Russian shops, but only 191 in 1918, 152 of which were intended for freight traffic and only 39 for passenger trains.

Exports of Railway Track Material in June

The exports of rails and switches, etc., in June were not as great as in May. Of rails, 67,028 tons, valued at $4,208,872, were exported in June, as compared with exports in May of 76,134 tons, valued at $4,902,970. The exports of switches, frogs, etc., in June totaled $1,359,725 as compared with $1,881,626 in May.

Japanese China and Japan were the largest customers in June, and large shipments were made to France and Belgium.

The figures in detail as compiled by the Division of Statistics of the Bureau of Foreign and Domestic Commerce are as follows:

Countries	Spikes		Steel Rails		Switches, frogs, splice bars, etc.
	Pounds	Dollars	Tons	Dollars	Dollars
Belgium	1,184,499	94,551	7,593	426,703	218,475
Denmark	.....	.....	200	16,880	1,512
France	2,988,075	164,977	8,397	527,483	450,885
Italy	.....	.....	1,959	156,720	152,167
Netherlands	.....	.....	1,315	83,662	31,176
Norway	.....	.....	82	5,350	450
Portugal	.....	.....	1,609	94,036	.....
Russia in Europe	1,590,200	41,345	355	20,643	12,560
Spain	.....	.....	404	24,670	38
England	.....	.....	278	15,055	2,483
Scotland	.....	.....	49	2,834	272
British Honduras	.....	.....	.....	.....	53
Canada	53,028	1,683	717	41,928	26,806
Costa Rica	14,000	647	.....	.....	.....
Guatemala	1,400	59	.....	.....	180
Honduras	33,000	1,228	860	42,581	96
Nicaragua	5,000	228	.....	.....	323
Panama	.....	.....	.....	.....	2,627
Salvador	28,000	1,872	.....	.....	11
Mexico	190,781	11,693	2,093	86,948	26,265
Miquelon, Langley, etc.	1,218	148	.....	.....	.....
Newfoundland and Labrador	960	64	12	638	2,281
Jamaica	.....	.....	220	12,089	1,005
Other British West Indies	.....	.....	19	1,579	.....
Cuba	450,146	13,021	4,232	226.677	53,435
French West Indies	7,600	337	222	10,625	898
Haiti	55,000	2,008	2	200	75
Dominican Republic	8,000	488	994	50,782	4,855
Argentina	.....	.....	4	360	.....
Bolivia	.....	.....	.....	.....	3,092
Brazil	397,930	19,219	1,513	98,610	33,932
Chile	4,000	235	567	49,290	19,843
Colombia	48,400	1,897	972	54,045	2,046
British Guiana	1,000	50	.....	.....	24
Peru	.....	.....	771	43,281	18,115
Uruguay	.....	.....	.....	.....	1,248
Venezuela	.....	.....	.....	.....	938
China	18.116	1.725	3, 194	233.937	6,291
Japanese China	1,218,954	55,927	12,115	900,970	100,932
Chosen	.....	.....	50	3,061	257
British India	.....	.....	562	48.404	1,885
Dutch East Indies	144.400	12,700	2,360	123.376	19,534
Hongkong	16.632	808	202	14,024	906
Japan	1,232.664	56,179	12,689	762,670	130,395
Australia	22,000	1,200	.....	.....	14,064
Philippine Islands	852	25	14	870	3,828
Belgian Kongo	.....	.....	40	2,791	2,660
British So. Africa	.....	.....	.....	.....	491
Portuguese Africa	12,088	752	363	19,100	266
Total	9,727,943	484,466	67,028	4,208,872	1,359,725

SUPPLY TRADE NEWS

GENERAL

The Page Steel & Wire Company, New York, has opened a branch office at 29 South La Salle street, Chicago, and another in the Book building, Detroit.

The Goulds Manufacturing Company, Seneca Falls, N. Y., will open a district sales office in the Dime Bank building, Detroit, Mich., on September 1. This office will be placed in charge of E. B. Gould, who has recently returned from 18 months' service in France.

Pettibone-Mulliken Company, Chicago, has awarded a contract to the Westinghouse, Church, Kerr & Company, Chicago, for the erection of a one-story steel foundry at West Division street, Chicago, which will cost about $200,000 including equipment.

The Duff Manufacturing Company of Pittsburgh is constructing an addition to its works at that place. This is a new building, 160 ft. by 80 ft., of brick and steel construction, designed to accommodate the forge shop and heat treating department.

The **Light Railway Equipment Company,** Philadelphia, Pa., manufacturers of frogs, switches, portable track, cars and electric locomotives, has been taken over and is now controlled by the **L. B. Foster Company,** Pittsburgh, Pa. **B. H. Behrens** has been made general manager of sales with offices at Pittsburgh and **H. A. Ellis** has been appointed general manager of a recently completed factory at Holmes, Pa. Branch offices have been opened in the Commercial Trust Building, Philadelphia, and the Tribune Building, New York.

The Hazard Manufacturing Company, Wilkes-Barre, Pa., opened a new sales office and warehouse at 1415 Wazee street, Denver, Colo., in charge of **Ernest P. Kipp,** district manager, on July 1. The Denver office will cover the intermountain district including Colorado, Wyoming, Montana, Idaho, Utah, New Mexico, and the western portions of Nebraska and South Dakota. Mr. Kipp served as a captain in the U. S. Engineers, and has received his honorable discharge.

The Chicago Pneumatic Tool Company, which plans to move its general offices from Chicago to New York, is erecting an office building at 6-8 East Forty-fourth street, New York City. This will be a 10-story structure, all of which will be occupied by the company. The ground floor will contain a permanent exhibition room for the display of Chicago Pneumatic products. A service station will be maintained in conjunction. After the transfer of headquarters the Chicago sales and service organization will be continued on a more extensive scale than formerly. The new building is to be ready for occupancy early in 1920. **J. L. Canby** has been appointed district manager of sales, Chicago, with offices at Chicago, succeeding **Nelson B. Gatch,** who has been transferred to the New York office.

PERSONAL

H. A. Wolcott has been appointed district manager of the Ohio Locomotive Crane Company, Bucyrus, Ohio, for the Chicago territory, with office in the Lytton building, Chicago.

Earle W. Vinnedge has received his discharge from military service and has been appointed sales engineer for the Worthington Pump & Machinery Corp., New York, with headquarters at Cincinnati, Ohio.

D. C. Schultz, Sr., who has a wide experience in the design and sale of Morgan & Northern cranes, has been appointed sales manager of the Pittsburgh Crane & Equipment Co., with headquarters at Sharpsburg, Pa.

J. Leonard Replogle, president of the American Vanadium Company, New York, also president of the Wharton & Northern Railroad and chairman of the board of directors of the Wharton Steel Company, who, during the period of the war was director of steel supplies for the War Industries

Board, has had conferred upon him by the French Government the decoration of Chevalier of the Legion of Honor, in recognition of services rendered by him in the Allied cause during the war.

Frank O. Leitzell, assistant to the general manager of the H. K. Porter Company, Pittsburgh, Pa., has been appointed an engineer-salesman in the sheet and tin mill specialties department of the Blaw-Knox Co., Pittsburgh, Pa.

E. L. Ruby, railway supply agent in the Real Estate Trust building, Philadelphia, Pa., has taken over the manufacture and sale of the Hilliard Portable Milling Machine, a device designed to mill stock rails for housing in switch points, previously manufactured by the Hilliard Portable Milling Machine Company, Oil City, Pa.

Roland S. Lebarre, assistant manager of sales for the Cleveland, Ohio, district of the Carnegie Steel Company, Pittsburgh, Pa., has resigned to become general sales manager of the alloy steel department of the Interstate Iron & Steel Company, Chicago. He began his business career 20 years ago with the United States Steel Corporation and in 1902 entered the sales department of the Illinois Steel Company. During the past 14 years he has been assistant district manager of sales for the Carnegie Steel Company.

George H. Richie, sales engineer in New England and Eastern Canada for the Sullivan Machinery Company, Chicago, has been promoted to New England sales manager, to succeed George Elmer Wolcott, deceased. R. S. Weiner has been appointed district manager with headquarters at El Paso, Tex., in place of Don M. Sutor, who has been transferred to the St. Louis, Mo., office as sales manager for Missouri, Arkansas, Eastern Texas, Oklahoma, Kansas (except the oil territory), Western Kentucky and Western Tennessee. Phillips S. Jarvis has resigned as sales manager for the territory controlled from the St. Louis office and Marion C. Mitchell has been appointed sales manager for the territory in Indiana and Illinois previously controlled from the St. Louis office, with temporary headquarters at St. Louis. Daniel H. Hunter has been appointed sales manager for Louisiana, Texas (except the southwestern section), and the oil fields of Oklahoma and Kansas with headquarters at Dallas, Tex.

George C. Isbester, district sales manager of the Rail Joint Company, with headquarters at Chicago, has resigned to become district sales manager of welded and weldless products for the American Chain Company, Inc., with headquarters at Chicago, effective August 1. Mr. Isbester was connected with the mechanical department of the Great Northern Railway at St. Paul, Minn., from 1897 to 1899, leaving the Great Northern at this time to go to the Sargent Steel Company, with headquarters at Chicago. He remained with this company until about 1902, when he went with the Q & C Company, with headquarters at Chicago, afterwards becoming vice-president of that company. In 1912 he left the Q & C Company to go with the Rail Joint Company as district sales manager, which position he held until his change as noted above. Mr. Isbester has been a director of the National Railway Appliances Association for several years until his resignation recently. During the war Mr. Isbester served in the United States Naval Reserve Forces as lieutenant commander, having been on active duty from April, 1917, until he was placed on the inactive list in May, 1919. He was recalled to active duty on July 28, 1919, to be sworn in as Commander in the supply corps and after receiving this promotion he was again detached from active duty. Commander Isbester has also served with the Illinois Naval Militia for ten years.

G. C. Isbester

Alexander Chapman, assistant district sales manager of the Rail Joint Company, with headquarters at Chicago, has been promoted to district sales manager with the same headquarters, succeeding **Geo. C. Isbester,** who has resigned to go with another company as noted elsewhere in these columns. Mr. Chapman was born in 1880 at Jersey City, N. J., and received his education in the Stevens Preparatory School and the Stevens Institute at Hoboken, N. J., from which institution he graduated in 1902. He entered the engineering department of the Rail Joint Company at Newark, N. J., in the following year. After a short time in that department he entered the mills of the company as an inspector and served in that capacity at Delaware, N. J., Buffalo, N. Y., and Columbus, Ohio, returning to the headquarters office in 1908 to take a position in the order department. In 1914, he was transferred to the Chicago office as assistant district sales manager, in which position he remained until his recent promotion to district sales manager.

A. Chapman

TRADE PUBLICATIONS

Spreaders.—A sixteen page folder has been issued by the Mann-McCann Company, Chicago, illustrating the various applications of the spreaders manufactured by that company to railroad work in this country and in Cuba and on the Panama canal.

Blaw Cableways.—The Blaw-Knox Company, Pittsburgh, Pa., has issued a 16-page booklet illustrating and describing the various appurtenances used in cableway construction, including carriages, falls, stops, spring bumpers, etc. The illustrations not only show the character of the devices but the nature of the possible installations as well.

Bridge Repair Outfit.—A folder has been issued by Ingersoll-Rand Company, introducing the Imperial bridge repair outfit, comprising pneumatic tools suitable for use in bridge maintenance work. These consist of one Imperial compressor car serving four lines, one No. 80 Little David riveting hammer, one No. 2 Little David drill, one sand blast of standard size and one paint spray.

Locomotive Cranes.—The Erie Engine Company, Erie, Pa., has issued a folder containing information relative to the type B Erie locomotive crane built by that company. This is arranged as a collection of short descriptions and illustrations of various applications of this equipment for dredging, trenching, loading material, hoisting, etc. Tables and diagrams of its dimensions and capacities are also given.

Owen Buckets.—The Owen Bucket Company, Cleveland, Ohio, recently issued two booklets descriptive of the character and use of the material-handling equipment manufactured by that company. The first of these, entitled "Owen Buckets," is a general explanation of the detailed parts of this bucket, followed by a general drawing and table of each class of bucket in turn, together with a folder illustrative of the character of work for which the bucket described is most suitable. The second booklet, "Owen Buckets in Operation," consists essentially of illustrations of the manner in which these buckets have been placed in practical use in excavating, handling materials and dredging, with a short exposition of the manner of using in each class of work.